VPDES PERMIT FACT SHEET

This document gives the pertinent information concerning the reissuance of the VPDES permit listed below. This permit is being processed as a minor municipal permit. The effluent limitations contained in this permit will maintain the Water Quality Standards of 9 VAC 25-260-00 et seq. The discharge results from the operation of a 0.015 MGD intermittent sand filter system. This permit action consists of adding nitrogen and phosphorus loading limits and revising the special conditions. (SIC Code: 4952)

1. **Facility Name and Address:**
   Morris Hill STP
   PO Box 432
   Covington, VA 24426-0432
   Location: Coles Mountain Road (SR 605), South of Gathright Dam

2. **Permit No: VA0032115** Existing Permit Expiration Date: September 19, 2014

3. **Owner/ Facility Contact:**
   William C. Siple, Acting Facility Manager; (540) 962-1138; William.C.Siple@usace.army.mil
   Anthony Lockridge, Equipment and Facilities Assistant; (540) 962-1138;
   Anthony.L.Lockridge@usace.army.mil

4. **Application Complete Date:** March 11, 2014
   Permit Drafted By: Becky L. France, Water Permit Writer
   Date: March 21, 2014, Revised 4/16/14
   DEQ Regional Office: Blue Ridge Regional Office
   Reviewed By: Kevin Crider, Water Permit Writer
   Date: April 22, 2014
   Public Comment Period Dates: From 4/27/14 To 5/27/14

5. **Receiving Stream Classification:**

Receiving Stream:	Jackson River (River Mile: 43.55)		
Watershed ID:	VAW-I04R (Jackson River/Falling Spring Creek Watershed)		
River Basin:	James River, Upper		
River Subbasin:	NA		
Section:	12		
Class:	VI		
Special Standards:	None		
7-Day, 10-Year Low Flow:	92.0 MGD	7-Day, 10-Year High Flow:	89.1 MGD
1-Day, 10-Year Low Flow:	92.5 MGD	1-Day, 10-Year High Flow:	90.3 MGD
30-Day, 10-Year Low Flow:	91.1 MGD	30-Day, 10 Year High Flow:	85.7 MGD
30-Day, 5-Year Low Flow:	90.1 MGD	Harmonic Mean Flow:	70.7 MGD
Tidal:	No	303(d) Listed:	No

Attachment A contains a copy of the flow frequency determination memorandum.

6. **Operator License Requirements:** None

7. **Reliability Class:** II

8. **Permit Characterization:**

( )	Private	( )	Interim Limits in Other Document
(X)	Federal	( )	Possible Interstate Effect
( )	State		
( )	POTW		
( )	PVOTW		

9. **Wastewater Treatment System:** A description of the wastewater treatment system is provided below. See **Attachment B** for the wastewater treatment schematics and **Attachment C** for a copy of the site inspection report. Treatment units associated with the discharge are listed in the table below.

Table I
DISCHARGE DESCRIPTION

Outfall Number	Discharge Source	Treatment (Unit by Unit)	Flow (Design) (MGD)
001	Morris Hill STP	septic tank dosing tank flow distribution box sand filters (3) tablet chlorinator chlorine contact tank cascade aeration	0.015

The Morris Hill STP treats domestic sewage from the Morris Hill Campground and the Gathright Dam and Lake Moomaw Offices/Visitor's Center. The campground is open from Memorial Day through Labor Day and the visitor's center is open year round. The 0.015 MGD sewage treatment works consists of a septic tank, sand filter, and tablet chlorinator system.

Wastewater from the restrooms is collected and routed into a 20,000-gallon septic tank. Supernatant from the tank flows by way of a 3700-gallon dosing tank to a sand filter. Once the dosing tank reaches capacity, the wastewater automatically discharges to a distribution box. The flow from the distribution box is routed to one of the two sand filters in operation. Due to the low flows, only one of the filters is used at any given time.

Sand filter underflow is routed to a dosing tank. Wastewater from the dosing chamber is routed through a Sanuril tablet chlorinator into a baffled chlorine contact tank. Chlorinated effluent flows through a weir/sample box and flows through a pipe down the mountain to the Jackson River.

10. **Sewage Sludge Use or Disposal:** No biosolids are generated by the facility as defined in 12 VAC 5-585-10 et seq. Septage from the septic tank is hauled to POTW as needed.

11. **Discharge Location Description:** A USGS topographic map which indicates the discharge location, any significant dischargers, any water intakes, and other items of interest is included in **Attachment D**. The latitude and longitude of the discharge is N 37°56'54", E 79°56'57".

    Name of Topo: Falling Spring Number: 159B

12. **Material Storage:** Calcium hypochlorite tablets are stored inside in a watertight container.

13. **Ambient Water Quality Information:** Memoranda or other information which helped to develop permit conditions (special water quality studies, STORET data, and any other biological and/or chemical data, etc.) are listed below.

    Morris Hill STP discharges into the Jackson River just below Gathright Dam. This segment of the Jackson River is flow regulated by the discharge from the dam. Critical stream flow determinations were based on the continuous record gauge on the Jackson River near Falling Spring, Virginia (#02012500) from 1925 to 1979 and the minimum flow requirements from Gathright Dam to maintain the flow of 158 cfs at Covington. The Falling Spring gauge is located approximately 8 miles downstream of the discharge. Measurements from this station were taken prior to flow regulation at Gathright Dam in December of 1979. These measurements were used to estimate the flow associated with the drainage area. Given the drainage area between Covington and Gathright Dam, the associated flow contributed from this drainage area was estimated using the drainage area proportions from the flow measurements at Falling Spring gauge. The estimated flows and Morris Hill STP design flow were then subtracted from 158 cfs to determine the flow frequencies above the treatment plant.

    STORET Station 2-JKS030.65 is the nearest ambient water quality monitoring station, and it is located nearly 13 miles below the discharge. The 90th percentile temperature and pH values used in the antidegradation wasteload allocation spreadsheet were determined from STORET station data between 2006 and 2014. Average hardness was determined from STORET station data between 2000 and 2003.

    Morris Hill STP discharges into the Jackson River/Falling Spring Creek Watershed (VAW-I04R). There are no impairments in this upper part of the watershed. However, there are four downstream impairments (PCBs, bacteria, benthic, and DO) in the Jackson River watershed.

    The fish consumption use is impaired for approximately 12.43 miles of the Jackson River from the Covington water intake downstream to just above the Lowmoor community due to PCB contamination in fish tissue. A Total Maximum Daily Load (TMDL) study is scheduled for completion in 2020.

A 12.43 mile segment of the Jackson River from the Covington water intake downstream to just above the Lowmoor community is impaired for bacteria. A TMDL study is scheduled for completion in 2020.

The EPA approved a benthic TMDL (7/21/10) for the impaired section of the Jackson River (I0R-01-BEN) extending 24.18 miles of the Jackson River from Westvaco main processing outfall downstream to the confluence of Karnes Creek. This benthic TMDL report also evaluates the dissolved oxygen impairment in this same segment. Total nitrogen and phosphorus wasteload allocations have been assigned to point source dischargers in the watershed.

14. **Antidegradation Review and Comments:** Tier I _____ Tier II __X___ Tier III _____

The State Water Control Board's Water Quality Standards includes an antidegradation policy (9 VAC 25-260-30). All state surface waters are provided one of three levels of antidegradation protection. For Tier I or existing use protection, existing uses of the water body and the water quality to protect these uses must be maintained. Tier II water bodies have water quality that is better than the water quality standards. Significant lowering of the water quality of Tier II waters is not allowed without an evaluation of the economic and social impacts. Tier III water bodies are exceptional waters and are so designated by regulatory amendment. The antidegradation policy prohibits new or expanded discharges into exceptional waters.

The antidegradation review begins with Tier determination. The Jackson River is not listed as a public water supply in the segment where the discharge is located. The Jackson River in this segment (VAW-I04R) is not listed on Part I of the 303(d) list for exceedances of water quality criteria. Available pollutant data have been analyzed, and the existing water quality condition for pollutants for which data exist compared to the water quality standards. This analysis indicates the water quality of the receiving stream does not exceed numeric criteria for any pollutant analyzed. In addition, natural trout waters are assumed to be Tier II unless information is available to indicate otherwise. Therefore, this segment of the Jackson River is classified as a Tier II water, and no significant degradation of existing quality is allowed.

For purposes of aquatic life protection in Tier II waters, "significant degradation" means that no more than 25 percent of the difference between the acute and chronic aquatic criteria values and the existing quality (unused assimilative capacity) may be allocated. For purposes of human health protection, "significant degradation" means that no more than 10 percent of the difference between the human health criteria and the existing quality (unused assimilative capacity) may be allocated. The antidegradation baselines for aquatic life and human health are calculated for each pollutant as follows:

Antidegradation baseline (aquatic life) = 0.25 (WQS – existing quality) + existing quality

Antidegradation baseline (human health) = 0.10 (WQS – existing quality) + existing quality

Where:
"WQS" = Numeric criterion listed in 9 VAC 25-260-00 et seq. for the parameter analyzed
"Existing quality" = Concentration of the parameter being analyzed in the receiving stream

When applied, these "antidegradation baselines" become the new water quality criteria in Tier II waters, and effluent limits must be written to maintain the antidegradation baselines for each pollutant. Antidegradation baselines have been calculated as described above and included in **Attachment F**.

The Morris Hill STP began discharging in 1981. The water quality criteria for dissolved oxygen (DO) predate the Morris Hill STP discharge so effluent limits have been established to maintain the existing high level of dissolved oxygen in the stream. These limits prevent a significant lowering of DO more than 0.20 mg/L from the existing level (90 percent DO saturation value) in the receiving stream. Water quality criteria for ammonia, chlorine, and other toxic pollutants were not adopted until 1992 after the facility began discharging. In accordance with Guidance Memo 00-2011, the application of antidegradation for an existing discharge to Tier 2 waters consists of ensuring that all water quality criteria are met and establishing the existing baseline water quality to be maintained in the event of future expansions or new discharges to the same stream segment. Morris Hill STP is required to meet water quality criteria for toxic pollutants, and antidegradation baselines will apply if the facility is expanded. The permit limits for this reissuance are in compliance with antidegradation requirements set forth in 9 VAC 25-260-30.

15. **Site Inspection:** Date: 10/1/13 Performed by: Becky L. France
Attachment C contains a copy of the site inspection memorandum. The last DEQ technical and laboratory inspection was conducted by Gerald A. Duff on August 8, 2013.

16. **Effluent Screening and Limitation Development:** DEQ Guidance Memo 00-2011 was used in developing all water quality based limits pursuant to water quality standards (9 VAC 25-260-5 et seq.). Refer to **Attachment F** for the antidegradation wasteload allocation spreadsheet and effluent limit calculations. See **Table II** on page 15 for a summary of limits and monitoring requirements.

A. **Mixing Zone**

Effluent is discharged into the Jackson River below Gathright Dam. The Agency mixing zone program, MIXER, was run to determine the percentage of the receiving stream flow that can be used in the antidegradation wasteload allocation calculations. The program indicated that 10.47 percent of the 1Q10 and 100 percent of the 7Q10 may be used for calculating the acute and chronic antidegradation wasteload allocations (AWLAs). A copy of the printout from the MIXER run is included in **Attachment F**.

B. **Effluent Limitations for Conventional Pollutants**

Flow –The permitted design flow of 0.015 MGD for this facility is taken from the previous permit and the application for the reissuance. Between October 2009 and February 2014 the highest monthly average flow was 0.0034 MGD which is well below the design flow. In accordance with the VPDES Permit Manual, flow is to be estimated and reported each discharge day.

pH –The pH limits of 6.0 S.U. minimum and 9.0 S.U. maximum have been continued from the previous permit. These limits are based upon the water quality criteria in 9 VAC 25-260-50 for Class VI receiving waters and are in accordance with federal technology-based guidelines, 40 CFR Part 133, for secondary treatment. The VPDES Permit Manual recommends a monitoring frequency of 1/day for this parameter. The permittee does not add chemicals during the treatment process. The facility discharges infrequently during the winter months. Discharge may occur at night when the facility is not staffed, so pH monitoring may not be feasible when the facility discharges at night. The permittee does not add chemicals during the treatment process. During the permit term between March 2011 and February 2014, the pH ranged from 6.5 S.U. to 7.3 S.U. Only one of the pH data points was within 0.50 S.U. of the permit limit. Given the nature of the intermittent discharge and the simplicity of the treatment process, a monitoring frequency of 1/discharge-week has been continued from the previous permit.

Biochemical Oxygen Demand (BOD_5), Dissolved Oxygen (DO) – Between December 2007 and September 2013 there were no exceedances of the BOD_5 limitations. Between March 2011 and February 2014 there were no DO values below the minimum limit. (**Attachment H**).

Flow, temperature, and effluent data were entered into the Regional Water Quality model for Free Flowing Stream (Version 4.0) to verify that the BOD_5 limits are adequate. A copy of the model output results is found in **Attachment G**. An initial DO concentration of 6.5 mg/L, a TKN value of 20 mg/L, and 30 mg/L for BOD_5 were used in the model input. The background dissolved oxygen was 7.973 mg/L. The model predicted no dissolved oxygen (DO) sag at the initial discharge point. So, these effluent concentrations are in compliance with antidegradation requirements set forth in 9 VAC 25-260-30. Therefore, current treatment limits for BOD_5 and DO are protective of water quality.

BOD_5 limits are technology-based requirements for municipal dischargers with secondary treatment required in accordance with 40 CFR Part 133. The limits for BOD_5 are also in accordance with the former 9 VAC 25-720-60 of the Water Quality Management Plan (WQMP) for the Jackson River part of the James River Basin, which defines secondary treatment. The former WQMP allocates 1.7 kg/d (monthly to the facility which at 0.015 MGD design capacity translates to a concentration of 30 mg/L. The secondary treatment regulation sets the weekly average limits as 1.5 times the monthly average limit. These effluent limits of 30 mg/L (1700 g/d) monthly average and 45 mg/L (2500 g/d) have been continued from the previous permit. Grab samples shall be collected. The VPDES Permit Manual recommends a monitoring frequency of 1/month for these parameters. However, the facility qualifies for a reduced monitoring frequency of 1/ 6 months. See **Attachment H** for a summary of the monitoring data and reduced monitoring frequency criteria.

The minimum DO limit of 6.5 mg/L has been continued from the previous permit. The receiving stream is classified as a natural trout water which has a minimum dissolved oxygen criteria of 6.0 mg/L. Given the high level of dilution, a DO limit of 6.5 mg/L appears protective of the dissolved oxygen in the receiving stream. Grab samples shall be collected. The VPDES Permit Manual recommends a monitoring frequency of 1/day for this parameter. However, the facility qualifies for a reduced monitoring frequency of 1/discharge-week. This monitoring frequency is being continued from the previous permit term. See **Attachment H** for a summary of the monitoring data and reduced monitoring frequency criteria.

E. coli – A section of the Jackson River downstream of the discharge point has been designated as impaired due to bacteria. A Total Maximum Daily Load study has been planned for completion in 2020. It is anticipated that all point source dischargers including Morris Hill STP will have *E. coli* wasteload allocations to ensure compliance with the TMDL. For the VPDES permit application, collected one grab sample for *E. coli* and the result of 1 MPN/100 mL was well below the water quality criteria for *E. coli.* Therefore, it is believed that the chlorine limitations are adequate, and additional *E. coli* monitoring is not necessary to verify adequate disinfection. In the event that the facility is assigned a wasteload allocation as part of the TMDL it may be necessary to include a limit and require monitoring in a future permit reissuance.

Total Phosphorus, Total Nitrogen – A section of the Jackson River downstream of the discharge point has been designed as impaired due to benthic life assessments. Total Maximum Daily Load (TMDL) allocations were approved for total nitrogen and total phosphorus. Nitrogen and phosphorus wasteload allocations for the growing season have been assigned to all dischargers in the watershed. The growing season is defined in the TMDL as June – October. The growing season allocations for Morris Hill STP are 764 lb total nitrogen and 191.1 lb total phosphorus. The allocations are based on a discharge of 40 mg/L total nitrogen and 10 mg/L total phosphorus and the design flow of 0.015 MGD. The limitations are calculated for compliance on a seasonal basis annually from monthly monitoring. Monthly load calculations use a minimum of one grab sample. A special condition has been included in Part I.C.11 with the specifics on calculation of the limits from monitored data.

C. **Effluent Limitations for Toxic Pollutants**

Ammonia as N -- The need for an ammonia limit has been reevaluated using revised water quality criteria and flows. The acute water quality criteria and wasteload allocations were calculated and are included in the spreadsheet in **Attachment F**. Since the facility discharges intermittently, only the acute wasteload allocation was input into the Agency's STATS program to determine if a limit is needed. As recommended in Guidance Memo 00-2011, a default ammonia concentration of 9 mg/L was input into the program. The program output indicates that a permit limit is not necessary for ammonia **(Attachment F)**.

Total Residual Chlorine (TRC) -- As noted in Guidance Memo 00-2011, all chlorinated effluent must have a chlorine limit because there is a reasonable potential for the facility to cause or contribute to a violation of the standards. This Guidance Memo also recommends an upper, technology based wasteload allocation of 4.0 mg/L where the chlorine limit, based solely on dilution, would be excessive. The effluent limits are technology based limits. The previous permit limits of 2.0 mg/L monthly average and 2.4 mg/L maximum weekly average have been continued. The limits were calculated by entering acute and chronic WLAs of 4.0 mg/L into the STATS program. The program used 4.0 mg/L wasteload allocations as the 97th percentile distribution that must be attained. Monitoring shall be continued once per discharge day using grab samples.

17. **Basis for Sludge Use and Disposal Requirements:** Since the facility proposes to pump and haul septage to a POTW, there are no sludge limits or monitoring requirements.

18. **Antibacksliding Statement:** Since there are no limitations less stringent than the previous permit, the permit limits comply with the antibacksliding requirements of 9 VAC 25-31-220 L of the VPDES Permit Regulation.

19. **Compliance Schedules:** There are no compliance schedules included in this permit.

20. **Special Conditions:** A brief rationale for each special condition contained in the permit is given below.

A. **Additional Total Residual Chlorine (TRC) Limitations and Monitoring Requirements (Part I.B)**

Rationale: This condition requires that the permittee monitor the TRC concentration after chlorine contact. In accordance with 40 CFR 122.41 (e) permittees are required, at all times, to properly operate and maintain all facilities and systems of treatment in order to comply with the permit. It specifies an *E. coli* limit when alternative disinfection methods are used. This condition is required by Sewerage Collection and Treatment Regulations, 9 VAC 25-790, bacteria standards. These requirements ensure proper operation of chlorination equipment to maintain adequate disinfection.

B. **95% Capacity Reopener (Part I.C.1)**

Rationale: This condition requires that the permittee address problems resulting from high influent flows, in a timely fashion, to avoid non-compliance and water quality problems from plant overloading. This requirement is contained in 9 VAC 25-31-200 B4 of the VPDES Permit Regulations.

C. **Indirect Dischargers (Part I.C.2)**

Rationale: This condition is required by VPDES Permit Regulation, 9 VAC 25-31-200 B1 for POTWs and PVOTWs that receive waste from someone other than the owner of the treatment works.

D. **CTC, CTO Requirement (Part I.C.3)**

Rationale: This condition is required by Code of Virginia § 62.1-44.19; Sewage Collection and Treatment Regulations, 9 VAC 25-790.

E. **Operation and Maintenance Manual Requirement (Part I.C.4)**

Rationale: An Operations and Maintenance Manual is required by the Code of Virginia § 62.1-44.19, the Sewage Collection and Treatment Regulations, 9 VAC 25-790; and the VPDES Permit Regulation, 9 VAC 25-31-190 E.

F. **Reliability Class (Part I.C.5)**

Rationale: Reliability class designations are required by Sewage Collection and Treatment Regulations, 9 VAC 25-790 for all municipal and domestic sewage facilities. Facilities are required to achieve a certain level of reliability to protect water quality and public health in the event of component or system failure. A Reliability Class II has been assigned to this facility.

G. **Closure Plan (Part I.C.6)**

Rationale: This condition establishes the requirement to submit a closure plan for the wastewater treatment facility if the treatment facility is being replaced or is expected to close.

H. **Sludge Reopener (Part I.C.7)**

Rationale: This condition is required by VPDES Permit Regulation, 9 VAC 25-31-220 C for all permits issued to treatment works treating domestic sewage to allow incorporation of any applicable standard for sewage sludge use or disposal promulgated under Section 405(d) of the Clean Water Act.

I. **Total Maximum Daily Load (TMDL) Reopener (Part I.C.8)**

Rationale: Section 303(d) of the Clean Water Act requires that Total Maximum Daily Loads (TMDLs) be developed for streams listed as impaired. This special condition is to allow the permit to be reopened if necessary to bring it into compliance with any applicable TMDL approved for the receiving stream. The reopener recognizes that, according to Section 402(o)(1) of the Clean Water Act, limits and/or conditions may be

either more or less stringent than those contained in this permit. Specifically, they can be relaxed if they are the result of a TMDL, basin plan, or other wasteload allocation prepared under Section 303 of the Act.

J. **Compliance Reporting (Part I.C.9)**

Rationale: In accordance with VPDES Permit Regulation, 9 VAC 25-31-190 J4 and 220 I, DEQ is authorized to establish monitoring methods and procedures to compile and analyze data on water quality, as per 40 CFR Part 130, Water Quality Planning and Management, Subpart 130.4. This condition is necessary when toxic pollutants are monitored by the permittee and a maximum level of quantification and/or specific analytical method is required in order to assess compliance with a permit limit or to compare effluent quality with a numeric criterion. This condition also establishes protocols for calculation of reported values.

K. **Effluent Monitoring Frequencies (Part I.C.10)**

Rationale: Permittees are granted a reduction in monitoring frequency based on a history of permit compliance. To remain eligible for the reduction, the permittee should not have violations related to the effluent limits for which reduced frequencies were granted. If the permittee fails to maintain the previous level of performance, the baseline monitoring frequency should be reinstated for those parameters that were previously granted a monitoring frequency reduction.

L. **Nutrient Reporting Calculations (Part I.C.11)**

Rationale: This special condition provides instructions for calculation of the seasonal nitrogen and phosphorus loading limits which will be compared to the Total Maximum Daily Load approved by the EPA.

M. **Permit Application Requirement (Part I.C.12)**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-100.D and 40 CFR 122.21(d)(1) require submission of a new application at least 180 days prior to expiration of the existing permit. In addition, the VPDES Permit Regulation, 9 VAC 25-31-100 E.1 and 40 CFR 122.21 (e)(1) note that a permit shall not be issued before receiving a complete application.

N. **Conditions Applicable to All VPDES Permits (Part II)**

Rationale: VPDES Permit Regulation, 9 VAC 25-31-190 requires all VPDES permits to contain or specifically cite the conditions listed.

21. **Changes to the Permit:**

A. **Special conditions that have been modified from the previous permit are listed below: (The referenced permit sections are for the new permit.)**

1. The Operations and Maintenance Manual Special Condition (Part I.C.5) has been revised in accordance with the VPDES Permit Manual.

2. The Compliance Reporting Special Condition (Part I.C.7) has been revised to include information about significant figures.

B. **New special conditions added to the permit are listed below:**

1. As required by the VPDES Permit Manual for all facilities treating domestic sewage, a Sludge Reopener Special Condition has been added as Part I.C.7.

2. A Nutrient Reporting Special Condition (Part I.C.11) has been added to provide instructions for calculating nitrogen and phosphorus loadings for Part I.A.

3. A Permit Application Requirement Special Condition (Part I.C.12) has been added to provide the specific due date for the required submittal of the application.

C. **Permit Limits and Monitoring Requirements:** See Table III on page 15 for details on changes to the effluent limits and monitoring requirements.

22. **Variances/Alternate Limits or Conditions:** No variances or alternate limits or conditions are included in this permit. A waiver was requested to allow that grab samples for TSS and BOD_5 required by the permit, be recorded on the application in lieu of composite samples. This waiver has been granted.

23. **Regulation of Treatment Works Users:** VPDES Permit Regulation 9 VAC 25-31-280 B9 requires that every permit issued to a treatment works owned by a person other than a state or municipality provide an explanation of the Board's decision on the regulation of users. There are no industrial users contributing to the treatment works.

24. **Public Notice Information required by 9 VAC 25-31-280 B:**

All pertinent information is on file and may be inspected, and arrangements made for copying by contacting Becky L. France at:

Virginia DEQ
Blue Ridge Regional Office
3019 Peters Creek Road
Roanoke, VA 24019
540-562-6700
becky.france@deq.france@deq.virginia.gov

Persons may comment in writing or by e-mail to the DEQ on the proposed permit action and may request a public hearing during the comment period. Comments shall include the name, address, and telephone number of the writer and of all persons represented by the commenter/requester, and shall contain a complete, concise statement of the factual basis for the comments. Only those comments received within this period will be considered.

The DEQ may decide to hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit. Requests for public hearings shall state (1) the reason why a hearing is requested; (2) a brief informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit; and (3) specific references, where possible, to terms and conditions of the permit with suggested revisions.

Following the comment period, the Board will make a determination regarding the proposed permit action. This determination will become effective, unless the DEQ grants a public hearing. Due notice of any public hearing will be given. The public may review the draft permit and application at the Blue Ridge Regional Office in Roanoke by appointment. A copy of the public notice is found in **Attachment I**.

25. **303(d) Listed Segments (TMDL):** This facility discharges directly to the Jackson River. There are no impairments in this upper part of the watershed. However, there are four downstream impairments (PCBs, bacteria, benthic, and DO) in the Jackson River watershed.

The fish consumption use is impaired for approximately 12.43 miles of the Jackson River from the Covington water intake downstream to just above the Lowmoor community due to PCB contamination in fish tissue. A Total Maximum Daily Load study is scheduled for completion in 2020. Morris Hill STP submitted with the reissuance application an exception request from PCB monitoring per Guidance Memo 09-2001. The request is granted and PCB monitoring for TMDL development is not included in this permit.

A 12.43 mile segment of the Jackson River from the Covington water intake downstream to just above the Lowmoor community is impaired for bacteria. A TMDL is scheduled for completion in 2020.

The *Benthic TMDL Development for the Jackson River, Virginia* report was approved by EPA on July 21, 2010 and the State Water Control Board on December 9, 2010. The impaired segment (I09R-01-BEN) of the Jackson River extends 21.14 miles from the Westvaco main processing

outfall downstream to the confluence of Karnes Creek. This benthic TMDL report also address the dissolved oxygen impairment in this same segment. The report includes a phosphorus wasteload allocation (191.1 lb) and a nitrogen wasteload allocation (764.4 lb) for Morris Hill STP. These limits have been included in the Morris Hill STP permit and are applicable during the growing season which the TMDL report defines as May through October.

26. **Additional Comments:**

A. **Previous Board Action:** None

B. **Staff Comments:** The discharge is not controversial, and is conformance with the existing planning document for the area.

C. **Public Comments:** No comments were received during the public comment period.

D. **Tables:**

Table I	Discharge Description (Page 2)
Table II	Basis for Monitoring Requirements (Page 14)
Table III	Permit Processing Change Sheet (Page 15)

E. **Attachments:**

A. Flow Frequency Memorandum
B. Wastewater Schematics
C. Site Inspection Report
D. USGS Topographic Map
E. Ambient Water Quality Information
   - STORET Data (Station 2-JKS030.65)
   - 2012 Use Attainment Assessment Report (Excerpt)
   - Benthic TMDL for Jackson River (Excerpt)
   - Water Quality Management Planning Regulation (9 VAC 25-720-60) (Excerpt)

F. Wasteload and Limit Calculations
   - Mixing Zone Calculations (MIXER 2.1)
   - Effluent Data
   - Antidegradation Wasteload Allocation Spreadsheet
   - STATS Program Results (ammonia, TRC)

G. Regional Water Quality Model Output (Version 4.0)
H. Justification for Reduced Monitoring Frequency Memorandum
I. Public Notice

Table II
BASIS FOR LIMITATIONS – MUNICIPAL

( ) Interim Limitations
(x) Final Limitations

OUTFALL: 001
DESIGN CAPACITY: 0.015 MGD

Effective Dates - From: Effective Date
To: Expiration Date

PARAMETER	BASIS FOR LIMITS	DISCHARGE LIMITS				MONITORING REQUIREMENTS	
		Monthly Average	Weekly Average	Minimum	Maximum	Frequency	Sample Type
Flow (MGD)	NA	NL	NA	NA	NL	1/D-Day	Estimate
pH (Standard Units)	1,2	NA	NA	6.0	9.0	1/D-Week	Grab
BOD_5	1,5	30 mg/L 1700 g/d	45 mg/L 2500 g/d	NA	NA	1/ 6 Months	Grab
Total Suspended Solids	1	30 mg/L 1700 g/d	45 mg/L 2500 g/d	NA	NA	1/ 6 Months	Grab
Dissolved Oxygen	4	NA	NA	6.5 mg/L	NA	1/D-Week	Grab
Total Nitrogen (TN) (June – Oct.)	3	NL mg/L	NA	NA	NA	1/Month	Grab
Total Phosphorus (TP) (June – Oct.)	3	NL mg/L	NA	NA	NA	1/Month	Grab
TN, monthly load (June – Oct.)	3	NL lb	NA	NA	NA	1/Month	Calculated
TP, monthly load (June – Oct.)	3	NL lb	NA	NA	NA	1/Month	Calculated
TN, total load (June – Oct.)	3	NA	NA	NA	764.4 lb	1/Year	Calculated
TP, total load (June – Oct.)	3	NA	NA	NA	191.1 lb	1/Year	Calculated
Total Residual Chlorine	1	2.0 mg/L	2.4 mg/L	NA	NA	1/D-Day	Grab

NA = Not Applicable
NL = No Limitations; monitoring only

1/D-Day = once per day of discharge
1/D-Week = once per week of discharge

The basis for the limitations codes are:

1. Federal Technology-Based Secondary Treatment Regulation (40 CFR Part 133)
2. Best Professional Judgment
3. Water Quality Based TMDL for Jackson River
4. Water Quality Criteria
5. Upper James-Jackson Subarea Water Quality Management Plan

Table III
PERMIT PROCESSING CHANGE SHEET

LIMITS AND MONITORING SCHEDULE:

Outfall No.	Parameter Changed	Monitoring Requirement Changed		Effluent Limits Changed		Reason for Change	Date
		From	To	From	To		
001	Total Nitrogen (TN) (June – Oct.)	NA	1/Month			Monitoring needed to assess compliance with TMDL nitrogen wasteload allocation required by Jackson River TMDL.	3/13/14
001	Total Phosphorus (TP) (June – Oct.	NA	1/Month			Monitoring needed to assess compliance with TMDL phosphorus wasteload allocation required by Jackson River TMDL.	3/13/14
001	TN, monthly load (June – Oct.)	NA	1/Month			Monitoring needed to assess compliance with TMDL nitrogen wasteload allocation required by Jackson River TMDL.	3/13/14
001	TP, monthly load (June – Oct.)	NA	1/Month			Monitoring needed to assess compliance with TMDL phosphorus wasteload allocation required by Jackson River TMDL.	3/13/14
001	TN, total load (June – Oct.)	NA	1/Year	NA	764.4 lb total load	Monitoring needed to assess compliance with TMDL nitrogen wasteload allocation required by Jackson River TMDL.	3/13/14
001	TP, total load (June – Oct.)	NA	1/Year	NA	191.1 lb total load	Monitoring needed to assess compliance with TMDL phosphorus wasteload allocation required by Jackson River TMDL.	3/13/14

Attachment A

Flow Frequency Memorandum

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY - WATER DIVISION
3019 Peters Creek Road, Roanoke, Virginia 24019

SUBJECT: Flow Frequency Determination
Morris Hill STP – Reissuance (VA0032115)

TO: Permit File

FROM: Becky L. France, Water Permit Writer

DATE: March 10, 2014

This memorandum supercedes the March 23, 2009 memorandum concerning the subject VPDES permit. Morris Hill STP discharges to the Jackson River just below Gathright Dam. Stream flow frequencies are required at this site to develop effluent limitations for the VPDES permit.

This segment of the Jackson River is flow regulated by the discharge from the dam to guarantee minimum flow requirements are met at the Covington target area for water quality purposes. The lowest flow required at the target area is 158 cfs. To determine the volume of water to be released from the dam at certain flow conditions, an estimate of the flow contributed by the drainage area between the target area and the dam is needed. This estimate was made using the USGS gauge on the Jackson River at Falling Springs, Virginia (#02012500). The gauge is located approximately 8 miles downstream of the discharge.

Critical stream flow determinations were based on the continuous record gauge on the Jackson River at Falling Springs from 1925 to 1979 and the minimum flow requirement of 158 cfs. Measurements from this station were taken prior to flow regulation at Gathright Dam in December of 1979. These measurements were used to estimate the flow associated with the drainage area. Given the drainage area between Covington and Gathright Dam, the associated flows contributed from this drainage area were estimated using the drainage area proportions from the flow measurements at the Falling Spring gauge. The estimated flows and the Morris Hill STP design flow were then subtracted from 158 cfs to determine the flow frequencies above the treatment plant.

The high flow months are December through May. The flow frequencies for the discharge point are listed on the attached table.

Flow Frequency Determination: Morris Hill STP

Reference Gauge (data from 1925-1979)
Jackson River at Falling Spring, VA (#02012500)
Drainage Area [mi^2] = 410

	ft^3/s	MGD		ft^3/s	MGD
1Q10 =	60.3	39.0	High Flow 1Q10 =	74	48
7Q10 =	63.5	41.0	High Flow 7Q10 =	82	53
30Q5 =	75.7	48.9	HM =	197	127
30Q10=	69.3	44.8	High Flow 3010=	103	67

Flow contributed by the intervening drainage area between Covington and Gathright Dam
Drainage Area [mi^2] = 101

	ft^3/s	MGD		ft^3/s	MGD
1Q10 =	15	10	High Flow 1Q10 =	18	12
7Q10 =	16	10	High Flow 7Q10 =	20	13
30Q5 =	19	12	HM =	49	31
30Q10=	17	11	High Flow 30Q10=	25	16

Morris Hill STP discharge 0.015 MGD 0.010 cfs

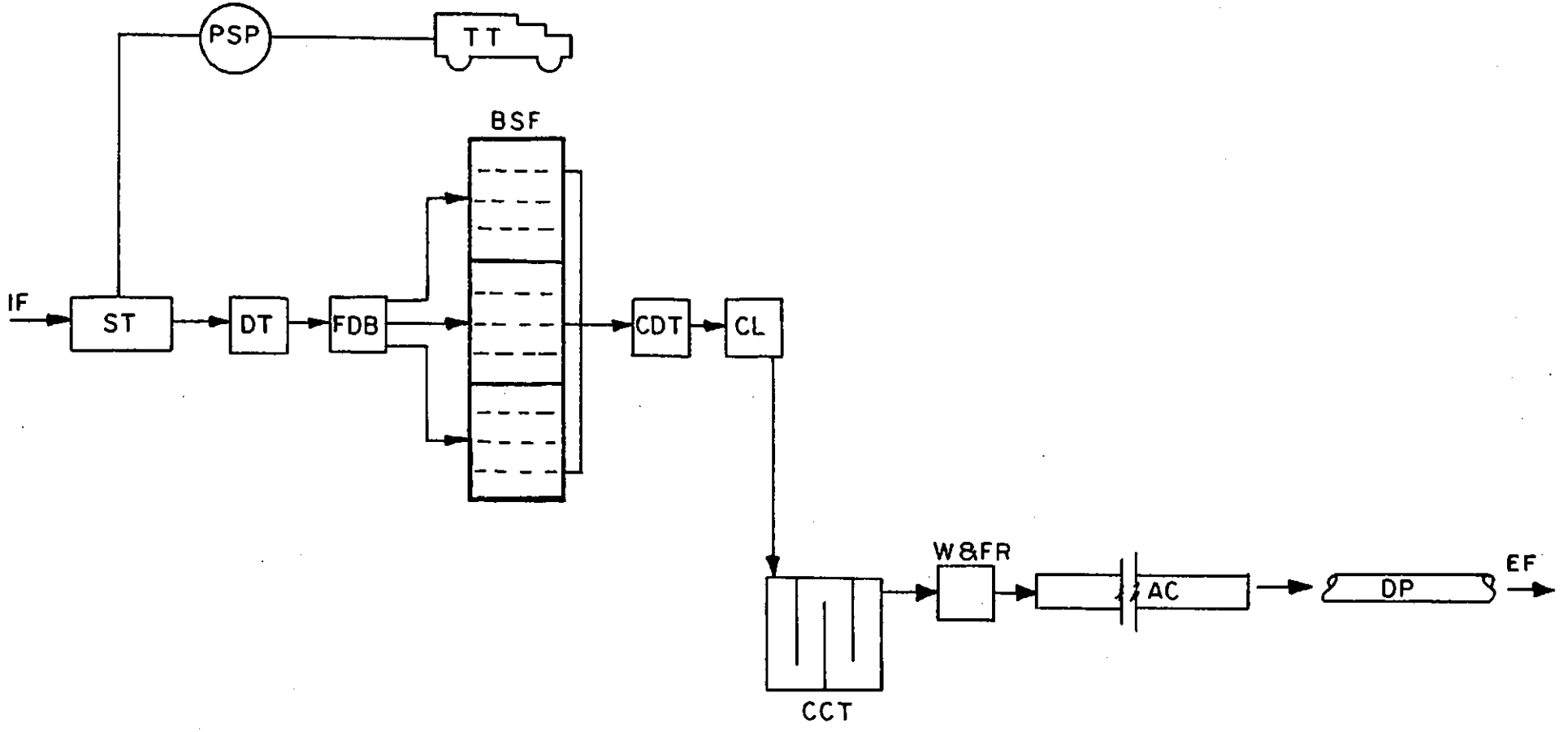
Flow frequencies for the reissued permit (9/20/14)
Jackson River above Discharge Point

	ft^3/s	MGD		ft^3/s	MGD
1Q10 =	**143**	**92.5**	**High Flow 1Q10 =**	**140**	**90.3**
7Q10 =	**142**	**92.0**	**High Flow 7Q10 =**	**138**	**89.1**
30Q5 =	**139**	**90.1**	**HM =**	**109**	**70.7**
30Q10=	**141**	**91.1**	**High Flow 30Q10=**	**133**	**85.7**

SITEID	NAME	RECORD	LATLONG	QUAD	DAAREA	HARMEAN	HF30Q10	HF7Q10	HF1Q10	Z30Q5	Z30Q10	Z7Q10	Z1Q10	Z1Q30	HFMTHS	STATPERIOD	YRSTRN	NOTES
02012500	Jackson River at Falling Springs, Va.	R, 1925-84	Lat 37 52'36", Long 79 58'38", NAD 83	Falling Spring	410.0	197	103	82	74	75.7	69.3	63.5	60.3	56	DEC-MAY	1925-1979	2012	Flow regulated by Lake Moomaw since Dec 1979

Attachment B

Wastewater Schematics



MORRIS HILL STP FLOW DIAGRAM

PLATE 2

ABBREVIATIONS

TT - TANK TRUCK
PSP - PORTABLE SLUDGE PUMP
IF - INFLUENT SEWAGE
ST - SEPTIC TANK
DT - DOSING TANK
FDB - FLOW DISTRIBUTION BOX
BSF - BIOLOGICAL (INTERMITTENT) SAND FILTERS
CDT - CHLORINATOR DOSING TANK
CL - CHLORINATORS
CCT - CHLORINE CONTACT TANK
W & FR - WEIR & FLOW RECORDER
AC - AERATION CHANNEL
DP - DIFFUSER PIPE
EF - EFFLUENT

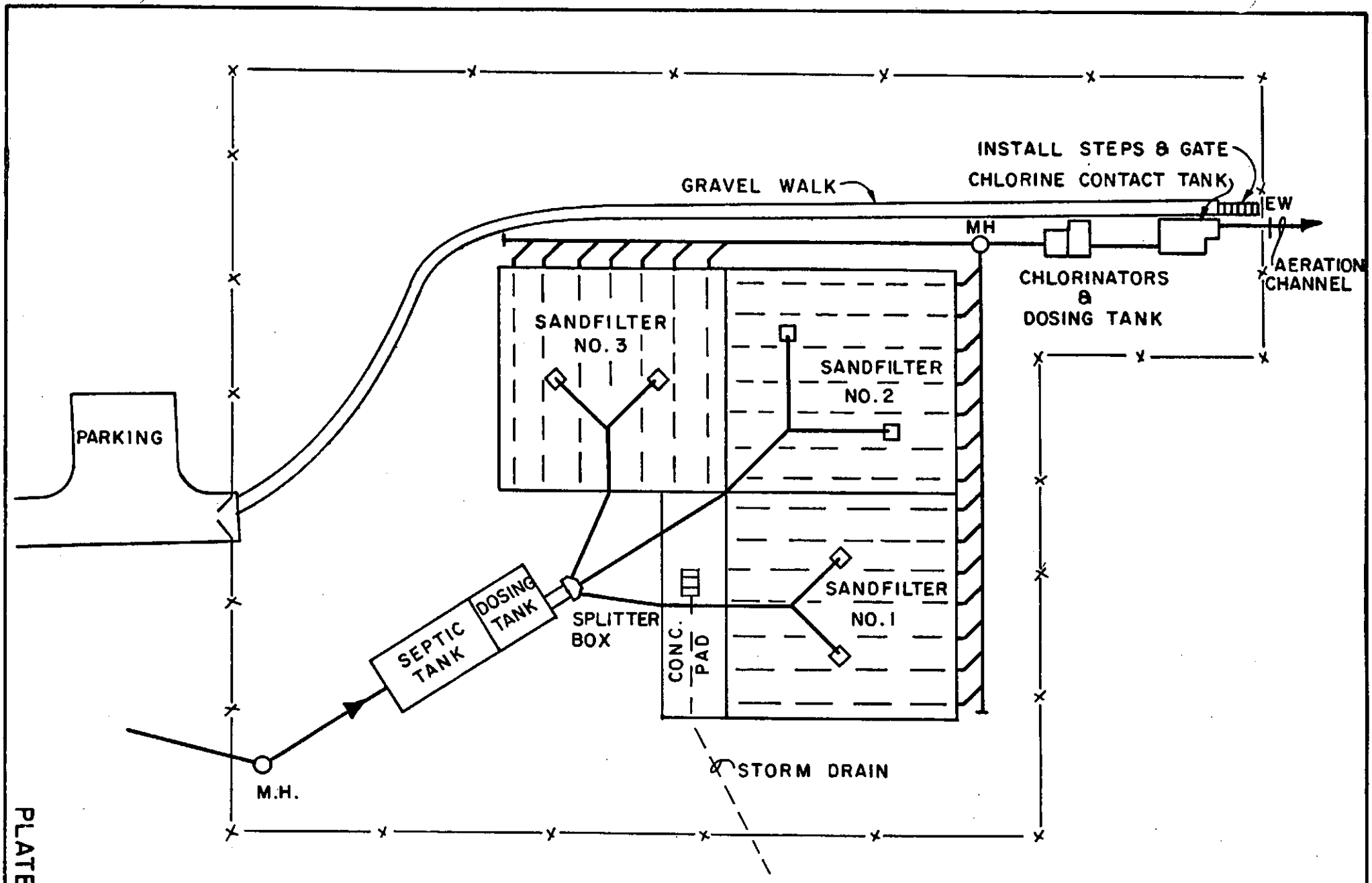


PLATE I

SITE PLAN

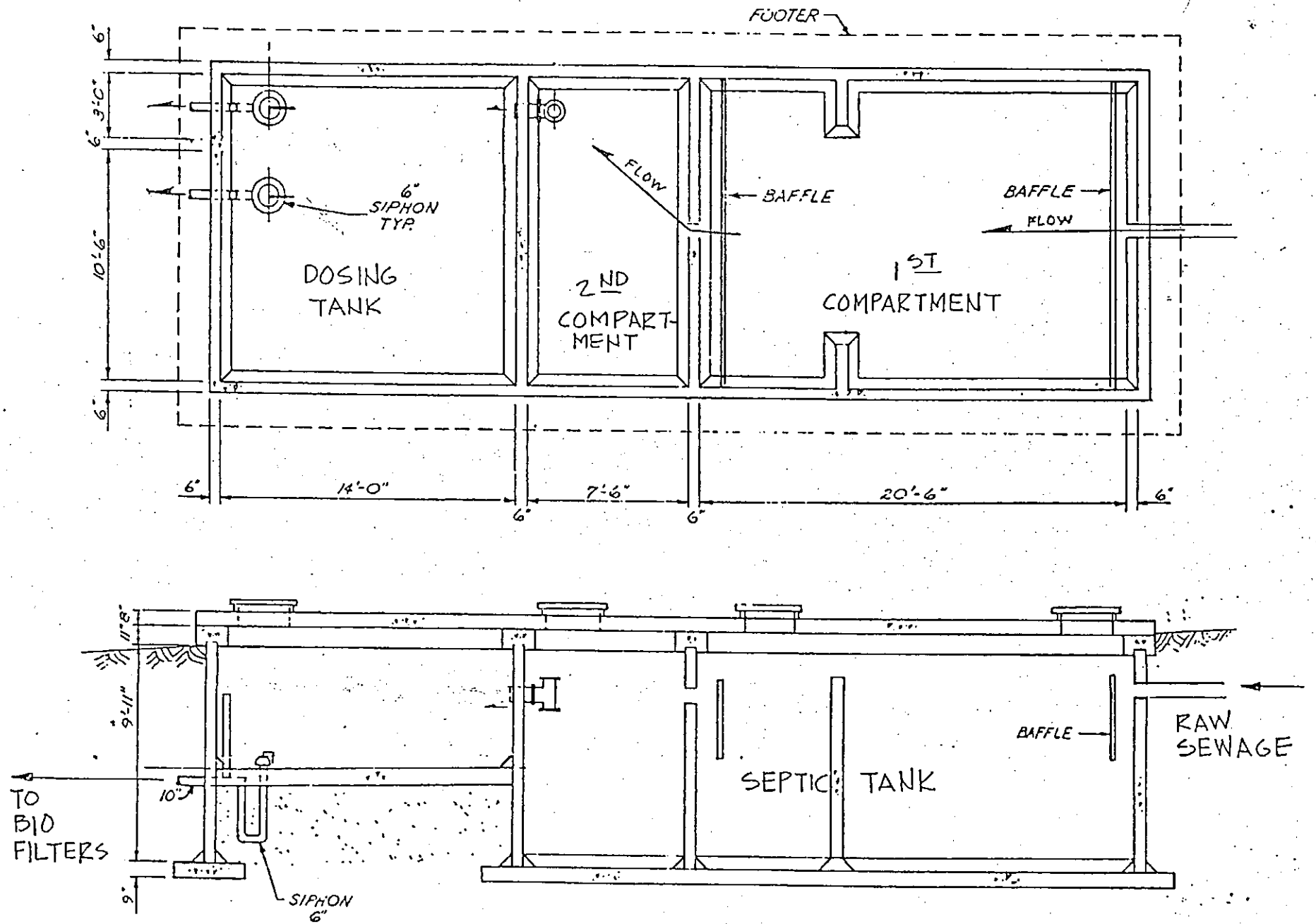
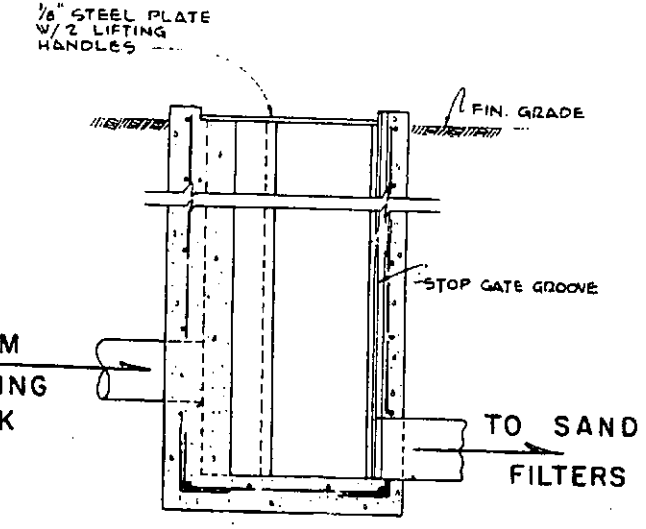


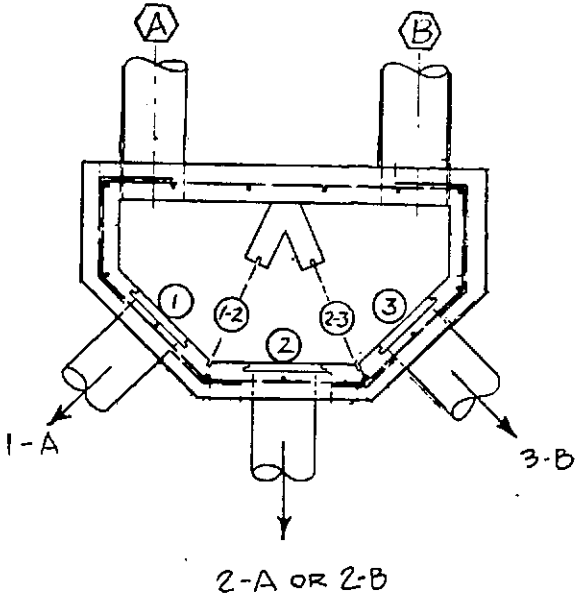
PLATE 3

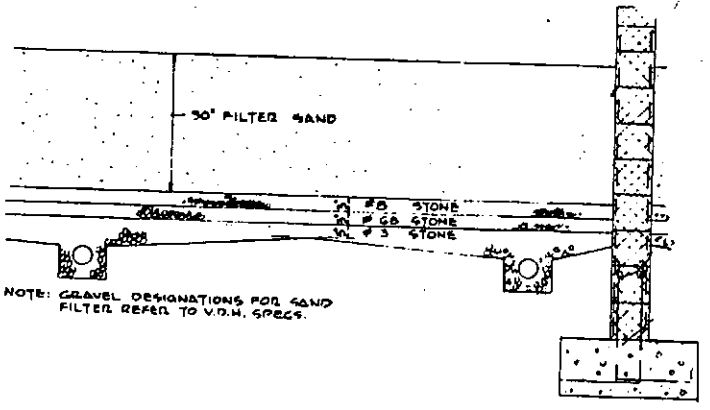
SEPTIC TANK

Rev 11/94



DISTRIBUTION BOX





TYPICAL FILTER SECTION

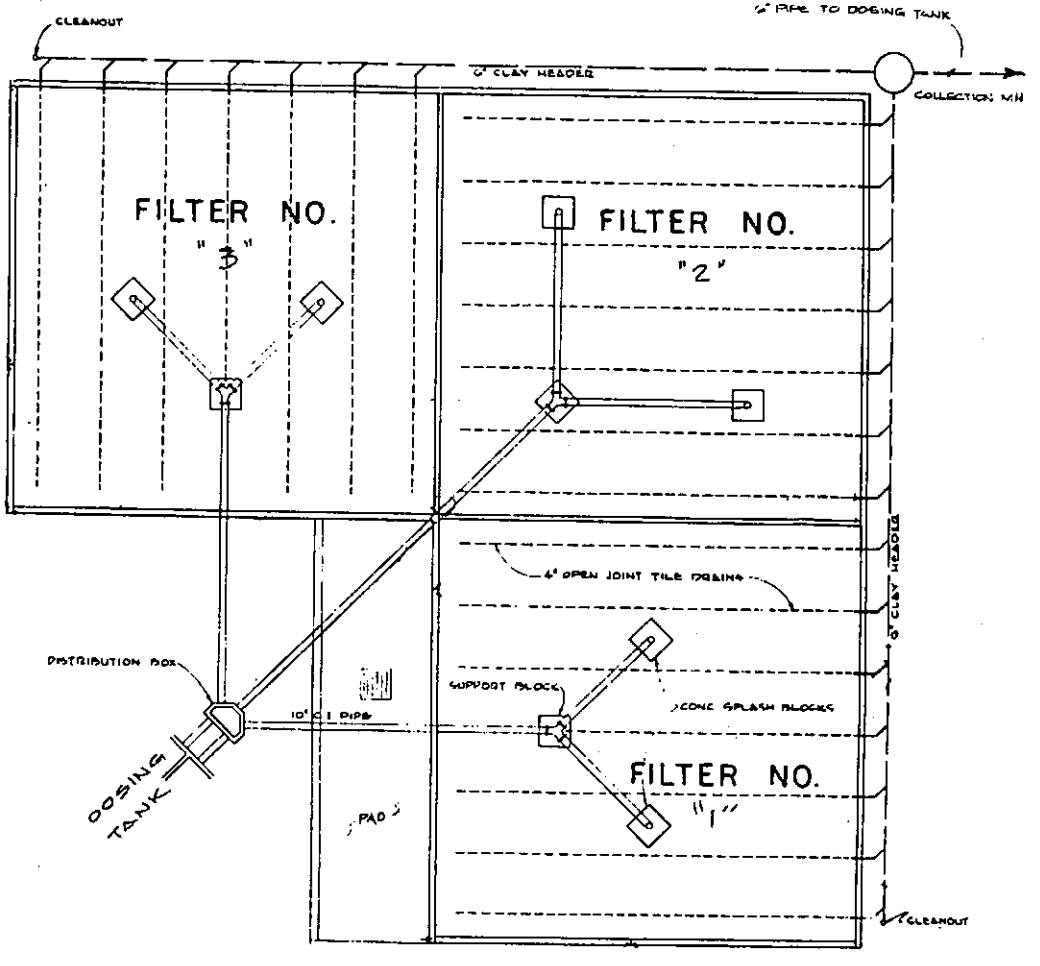
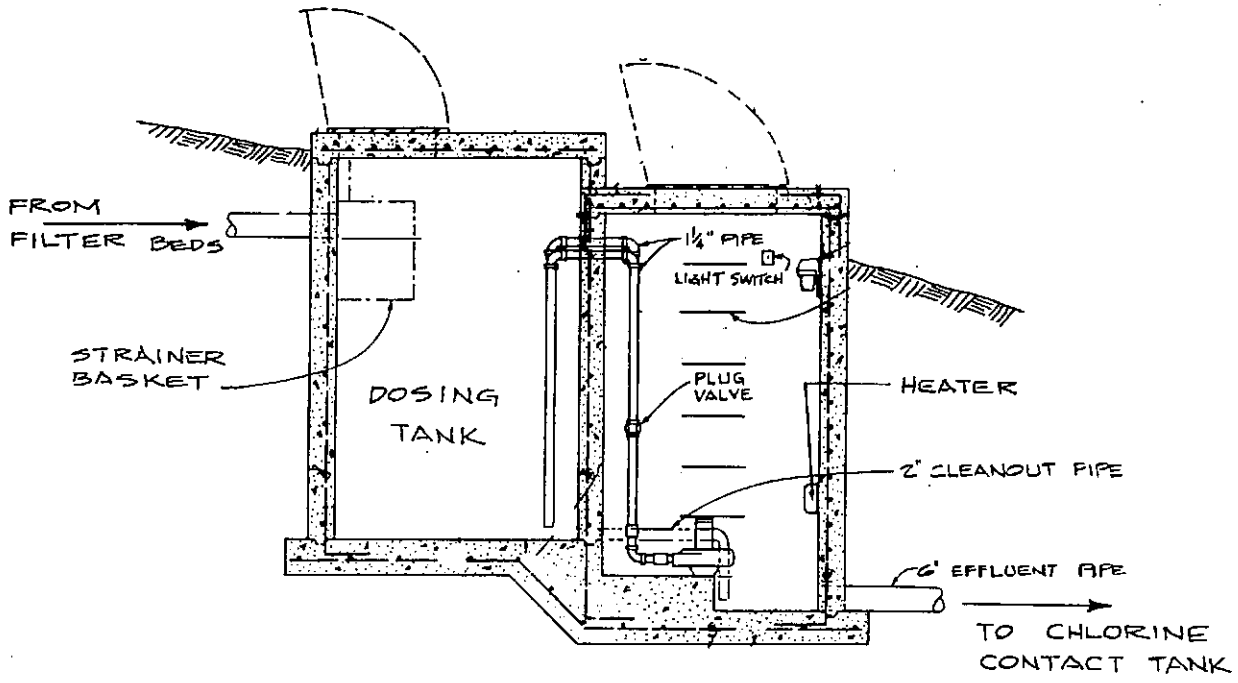
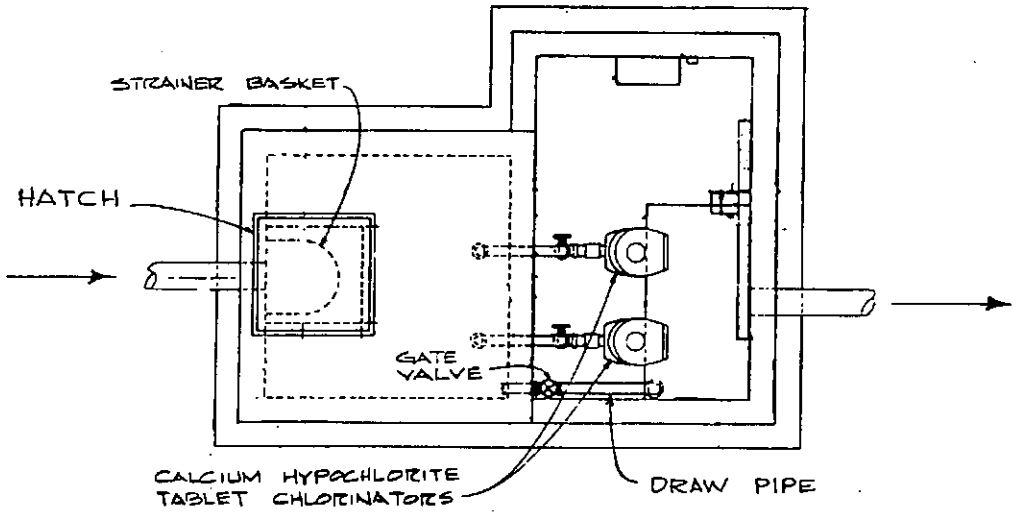


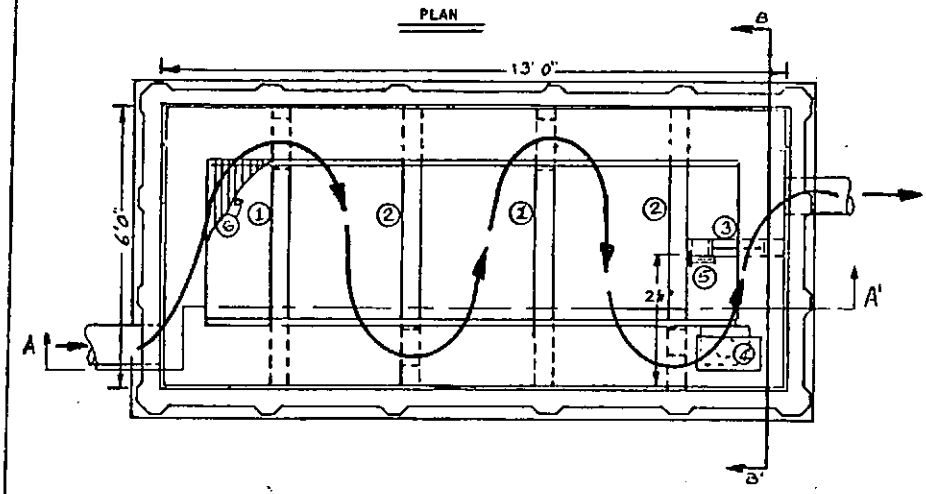
PLATE 4

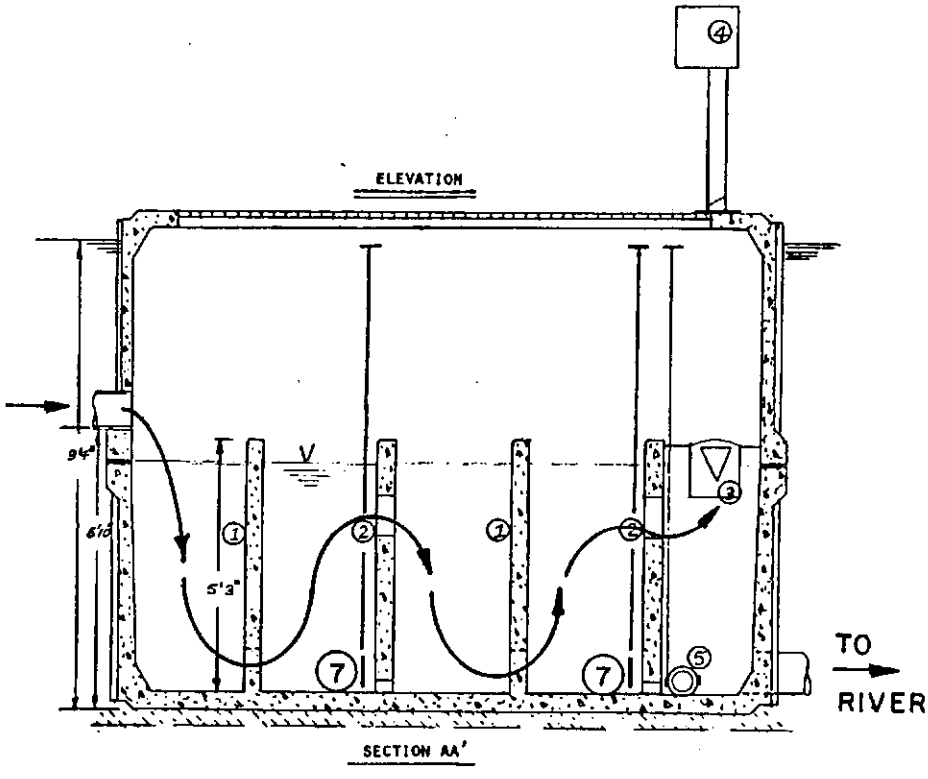
BIO SAND FILTERS

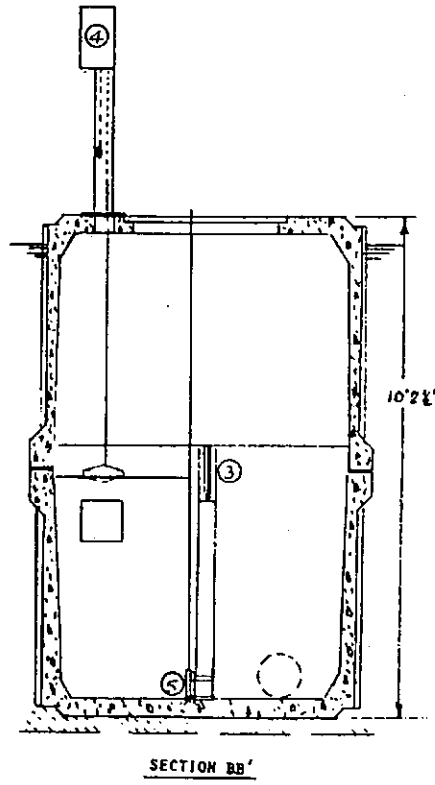




CHLORINATOR DOSING TANK & CHLORINATORS

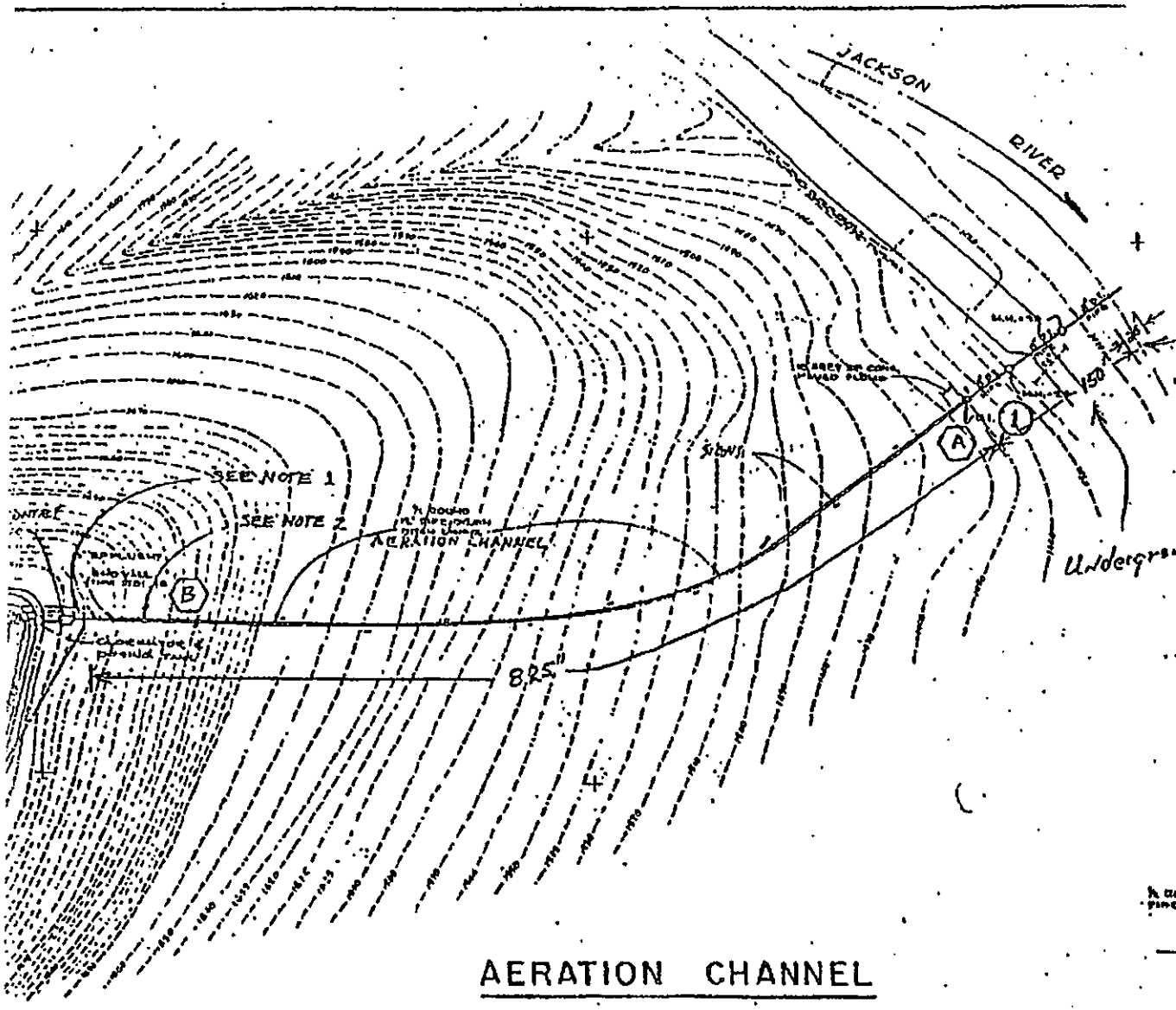




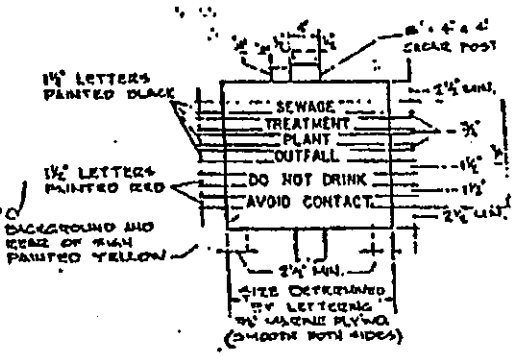


CHLORINE CONTACT TANK & FLOW RECORDER

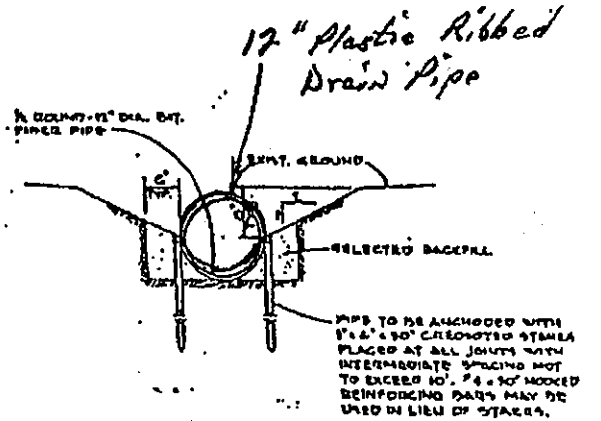
PLATE 6



AERATION CHANNEL



WARNING SIGN



AERATION CHANNEL SECTION

NOTE: 1. 12" diameter ribbed plastic drain pipe was installed in aeration channel in 1992 to eliminate problem with leaves, sticks, etc. clogging channel.

Attachment C

Site Inspection Report

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Blue Ridge Regional Office

3019 Peters Creek Road Roanoke, VA 24019

SUBJECT: Site Inspection Report for Morris Hill STP
Reissuance of VPDES Permit No. VA0032115

TO: Permit File

FROM: Becky L. France, Water Permit Writer

DATE: October 1, 2013

On October 1, 2013, a site inspection was conducted of the Morris Hill STP. Tim Flannagan, assistant operator, and Anthony Lockbridge, Maintenance Superintendent, were present at the inspection. The 0.015 MGD facility treats sewage for the Morris Hill Campground and the Gathright Dam Visitor's Center and offices. The campground is open from Memorial Day to Labor Day and the visitor's center is open year-round. Potable water is supplied by a well. All of the sewage collection and wastewater treatment facilities are owned and operated by the U.S. Army Corps of Engineers. The sewer connections for the campground are owned by the U.S. Forest Service. There is one pumping station to deliver flow from the administration building. The rest of the collection system flows by gravity.

The 15,000 gpd wastewater treatment system consists of septic tank, dosing tank, distribution box, three sand filters, tablet chlorinator, chlorine contact tank, flow meter, and cascade aeration. The system is underloaded and the average discharge during the summer months is approximately 1,800 gallons per day. In the winter months, the system may only discharge once per month. The disinfected effluent is piped about a quarter of a mile down the side of the mountain to the Jackson River.

The septic tanks is pumped about every two or three years and transported to a POTW. The wastewater from the 20,000 gallon dual chamber septic tank flows into a dosing tank. Once this tank reaches capacity, the wastewater automatically discharges to a distribution box. The distribution box consists of three gates that can be manually moved to control the flow to the sand filters. One of the sand filters is not used because the sand in the filter does not meet specifications. Due to the low flows, only one of the filters is used at any given time. Each of the two sand filters is used for about two years before switching to the other one.

The flow enters the sand filters through a 10-inch pipe, and is then dispersed over a splash pad onto the sand. Each filter consists of a 30-inch deep layer of sand overlain by graded gravel and collection tile. At the time of the site visit, one sand filter was in use and there was no ponding of wastewater on the filter. There was almost no vegetation on any of the sand filters.

Sand filter underflow is routed to a dosing tank with a tablet chlorinator and then into a baffled chlorine contact chamber. The tablet chlorinators are scheduled for replacement later this year. The effluent flows through a 12 inch pipe down the side of the mountain to the outfall on the Jackson River. The outfall is about a quarter of a mile below Gathright Dam. The facility has a flow recorder that indicates when a discharge occurs. During the month of September 2013 the recorder indicated flow on two days. Flow is estimated from the discharge weir. At the time of the site visit, there was no discharge from the plant.

Attachment D

USGS Topographic Map


Fence Line
UTM Grid and
1984 Magnetic No
Mill Well (Drinking Water)
Sewage Treatment Plant
No Boat Zone
(quarry)
Bridge
Gorge
Gathright Dam
Canoe Launch
Corps of Engineers
Property Line
Effluent Discharge Line
Kincaid
Cedar
Ridge
Jarrett
Hoover
Hollow
Jenkins Ford
Coles Point
Morris Hill
Ohio
Emory Ch.
U.S. GEOLOGICAL SURVEY
FALLING SPRING QUADRANGLE
7.5 MINUTE SERIES
SCALE: 1:24,000

Attachment E

Ambient Water Quality Information

- **STORET Data (Station 2-JKS030.65)**
- **2012 Use Attainment Assessment Report (Excerpt)**
- **Benthic TMDL for Jackson River (Excerpt)**
- **Water Quality Management Planning Regulation (9 VAC 25-720-60) (Excerpt)**

VAW-I04R
2-JKS030.65

Collection Date Time	Temp Celsius	Field pH (S.U.)
01/24/2006 12:00	5.9	7.7
03/30/2006 12:00	8.6	7.5
05/01/2006 12:30	13.3	7.6
07/31/2006 13:00	18.6	7.3
09/07/2006 13:00	17.6	8.2
11/14/2006 10:30	11	7.8
01/10/2007 11:30	7.2	7.1
03/22/2007 11:30	8.3	7.6
05/15/2007 13:00	13.9	7.5
07/26/2007 11:30	17.4	7.6
11/19/2007 13:00	10	7.3
01/08/2008 12:30	7.8	7.4
03/13/2008 12:30	9	7
03/25/2008 12:30	7.8	6.9
05/07/2008 12:00	10	7.1
07/29/2008 12:30	17.7	8.2
09/22/2008 12:00	15.2	8
11/24/2008 11:00	4.9	8.3
01/22/2009 13:00	1.4	7.9
03/11/2009 12:30	9	7.8
05/05/2009 13:30	8.5	7.4
07/07/2009 12:00	17	8.1
09/02/2009 13:00	16.5	8
11/30/2009 12:30	12	7.8
02/24/2010 11:25	4.2	7.6
04/01/2010 12:15	8.5	7.9
06/16/2010 13:10	18.7	7.8
08/16/2010 12:45	18.6	8
10/26/2010 12:05	15.4	7.9
12/29/2010 12:10	2	8.2
02/16/2011 11:00	4.1	8
04/19/2011 13:35	9.3	7.8
06/22/2011 12:20	18.1	7.7
08/16/2011 13:40	17.6	8
09/27/2011 10:40	16.6	7.7
09/28/2011 12:10	15.8	8.1
10/12/2011 13:55	15.6	8
12/28/2011 13:20	7.8	7.9
02/22/2012 13:15	6.7	7.6
03/08/2012 12:40	8.3	7.7
05/24/2012 13:30	16.3	8.2
07/05/2012 12:40	18.7	8.1
09/05/2012 14:15	18.7	8
11/27/2012 13:00	9.5	8.2
01/09/2013 11:55	4.6	7.7
02/05/2013 10:05	5.1	7.6
03/12/2013 13:45	6.2	7.7
04/02/2013 11:35	6.4	7.6
05/20/2013 10:50	14.9	8
06/18/2013 12:20	15.6	7.9
07/23/2013 11:40	16.8	7.6
08/13/2013 12:15	15.9	7.6
09/09/2013 13:05	16.7	7.8
10/02/2013 13:50	17.1	8.1
11/06/2013 12:30	14	7.8
12/16/2013 12:50	6	8
02/05/2014 11:40	4.4	7.5

90th Percentile Temp	18 °C	
90th Percentile Temp	13 °C	(Dec. - May)
90th Percentile pH	8.1 S.U.	
10th Percentile pH	7.4 S.U.	

VAW-I04R (Rt 687 Bridge - Clearwater Park)
2-JKS030.65

Collection Date Time	Hardness, Total (mg/L as CaCO3)
1/13/2000 8:45	108
2/24/2000 9:10	101
3/28/2000 8:50	80
4/19/2000 9:45	68
5/15/2000 9:50	89
6/1/2000 9:30	73
7/10/2000 10:00	80
8/1/2000 10:35	80.9
9/7/2000 10:30	77.4
10/4/2000 11:15	77.8
11/2/2000 9:30	78.6
12/6/2000 11:00	177.5
1/9/2001 9:30	88.9
2/1/2001 10:45	85.3
3/1/2001 10:30	45.7
4/2/2001 11:15	59.1
5/1/2001 10:00	43.4
6/5/2001 10:50	75.9
7/19/2001 11:00	41.6
8/16/2001 11:45	74.4
9/10/2001 11:20	74.1
10/10/2001 11:30	72.5
11/28/2001 10:20	57.9
12/18/2001 12:30	72.6
1/22/2002 10:55	76.8
2/19/2002 10:20	69.6
3/26/2002 11:10	94.7
4/17/2002 15:30	100
5/23/2002 13:00	72.9
6/17/2002 11:15	87.6
7/18/2002 12:45	75.6
8/7/2002 11:40	74.8
9/17/2002 11:50	297.2
10/21/2002 12:10	82.6
11/18/2002 12:30	84.2
12/16/2002 12:30	63.7
2/3/2003 13:05	80.9
3/3/2003 10:25	62.8
3/24/2003 12:45	50.7
5/1/2003 12:30	31.1
6/19/2003 10:30	80.7

Mean Hardness 82.2

VAW-I04R
2-JKS030.65

Collection Date Time	Arsenic, Dissolved (ug/L)	Cadmium, Dissolved (ug/L)	Chromium, Dissolved (ug/L)	Copper, Dissolved (ug/L)	Lead, Dissolved (ug/L)	Thallium, Dissolved (ug/L)	Nickel, Dissolved (ug/L)	Silver, Dissolved (ug/L)	Zinc, Dissolved (ug/L)	Antimony, Dissolved (ug/L)	Selenium, Dissolved (ug/L)
08/16/2010 12:45	<0.1	<0.04	0.072QQ	<0.04	0.022QQ	0.018QQ	<0.08	0.026QQ	<0.2	0.017QQ	<0.3
		<0.02	1.2	0.3	<0.01	<0.01	0.5	<0.004	0.3QQ	<0.001	0.1QQ
08/17/2010 11:30	<0.1	<0.04	0.077QQ	0.041QQ	0.014QQ	0.014QQ	<0.08	0.027QQ	0.4QQ	0.017QQ	<0.3
		<0.02	2.2	0.3	<0.01	<0.01	0.6	<0.004	0.4QQ	<0.001	0.1QQ
09/27/2011 10:40	<0.05	<0.07	<0.03	0.15	<0.02	<0.02	<0.04	<0.03	0.45QQ	<0.02	<0.17
	0.37	<0.03	0.58	0.18	<0.02	<0.02	0.58	<0.03	<0.4	<0.02	<0.3
09/28/2011 12:00	<0.05	<0.07	<0.03	0.04QQ	<0.02	<0.02	<0.04	<0.03	0.87QQ	<0.02	<0.17
	0.64	<0.03	0.89	0.34	<0.02	<0.02	0.74	<0.03	0.41QQ	0.02QQ	<0.3

2012 Impaired Waters

Categories 4 and 5 by DCR Watershed*

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

James River Basin

Fact Sheet prepared for DCR Watershed: I04*

Cause Group Code: **I09R-01-BEN** **Jackson River**

Location: Jackson River mainstem from the Westvaco main processing outfall downstream to the confluence of Karnes Creek.

City / County: Alleghany Co. Covington City

Use(s): Aquatic Life

Cause(s) / VA Category: Benthic-Macroinvertebrate Bioassessments/ 4A

The Jackson River General Standard - Benthic TMDL received U.S. EPA approval on 7/21/2010. The SWCB approved the Benthic TMDL on 12/9/2010. Federal IDs follow below by 2012 Assessment Units. The original 1996 VAW-I04R and VAW-I09R impairments were combined into one in 2002.

The 1996/1998 originally 303(d) Listed impairments to the benthic community are believed due to nutrient and organic enrichment (deposition) for 24.18 miles. Based on previous ambient station solids data, the nutrients and organics are mainly dissolved. Maxima have been greatly reduced since 1996.

The waters are partially de-listed (shortened- Category 2C) for 9.81 miles from the mouth of Karnes Creek downstream to the confluence of the Cowpasture and Jackson Rivers. The de-listing is based on Virginia Stream Condition Index (VSCI) scores of the 1996-1998 Listed reach currently achieving VSCI scores above 60 from station 2-JKS006.67. VSCI scores at 2-JKS006.67 have steadily increased since 2001. Improvements at discharging facilities have had a positive effect on the benthic community. Both the 2006 and 2012 flow adjusted trend analysis show a significant declining trend for total phosphorus and total nitrogen in both upstream station 2-JKS023.61 and downstream station 2-JKS000.38. 2007 - 2010 VSCI scores from four surveys have an average of 64.10. Benthic trend analysis also shows improving conditions at 2-JKS006.67 (+10 points) over the time period of 1994 - 2010. The VSCI is a multi-metric statewide stream index of biotic integrity that is based on data collected from minimally impacted reference sites throughout Virginia. This index shows that an SCI score of 60.0 is the lower limit for reference (or, unimpaired) conditions in a benthic community.

Federal IDs by Assessment Unit:

VAW-I04R_JKS01A00 - Total Phosphorus - 38981. Total Nitrogen - 39001.
VAW-I09R_JKS01A00 - Total Phosphorus - 39017. Total Nitrogen - 39022 De-list 2012- 3.48 miles.
VAW-I09R_JKS02A00 - Total Phosphorus - 38996. Total Nitrogen - 39003. De-list 2012- 1.71 miles.
VAW-I09R_JKS03A00 - Total Phosphorus - 38997. Total Nitrogen - 39004. De-list 2012- 4.62 miles.
VAW-I09R_JKS03B10 - Total Phosphorus - 38997. Total Nitrogen - 39004.
VAW-I09R_JKS04A00 - Total Phosphorus - 38995. Total Nitrogen - 39002.
VAW-I09R_JKS05A00 - Total Phosphorus - 38998. Total Nitrogen - 39005.
VAW-I09R_JKS06A00 - Total Phosphorus - 38999. Total Nitrogen - 39006.

2012 Benthic Assessment station locations are:
2-JKS000.38 - Rt. 727 Bridge - near Iron Gate (I09R)
2-JKS006.67 - Low Water Bridge - near Dabney Lancaster CC (I09R)
2-JKS013.29 - Off Rt. 696 above Lowmoor (I09R)
2-JKS018.68 - Rt. 18 Bridge at Covington (I09R)
2-JKS020.41- Upper Horse Shoe at Rayon Terrace (I09R)
2-JKS022.78- Fudge's Bridge, Rt. 154, Covington (I09R)
2-JKS023.61 - City Park - Covington at gage (I09R)

General Standard (Benthic):
2-JKS023.61-Bio 'IM' The 2012 data window reports an average Virginia Stream Condition Index (VSCI) score of 35.95 from five surveys (2006-2008 & 2010). The lowest score occurs in spring 2007 at 32.92 and the highest 38.47 fall 2008. Seven VSCI surveys (2003 - 2008) for 2010 have an average score of 45.15 with the lowest score in spring 2007 32.92 and highest score 57.38 spring 2004. The 2008 Integrated Report (IR) assessed seven VSCI surveys (2001 - 2006) with

James River Basin

Fact Sheet prepared for DCR Watershed: I04*

an average score of 34.36; lowest score spring 2001 at 31.03 and highest score 52.38 spring 2004. The invertebrate community at this site has been dominated by taxa that are tolerant of environments with low dissolved oxygen and high levels of organic pollution (i.e. Tubificidae, Tricladida, Chironomidae, Lumbriculidae and Simulidae). The VSCI scores display a negative alteration in the taxonomic diversity and pollution sensitivity of the benthic community. Recent improvement in the historical trend of the benthic community may be due to a reduction in cooling water discharges and efforts in the watershed to reduce nutrient discharge to the river. However, a recently discovered and repaired sewer line contributed pollution to the river and may be responsible for the VSCI decline since 2007.

Both 2006 and 2012 flow adjusted trend analysis find significant declining trends for total phosphorus and total nitrogen at 2-JKS023.61. The 2012 data window finds five of 41 total phosphorus samples are elevated above 0.20 mg/l ranging from 0.24 to 0.52 mg/l; although maxima are reduced. An 'Observed effect' is noted for these waters. Past values above 0.20 have been greater than 1.40 mg/l. The 2010 assessment finds elevated total phosphorus levels in six of 40 samples are above 0.20 mg/l. The maximum value is 0.40 mg/l and the lowest 0.28 mg/l. 2008 elevated total phosphorus levels were 17 of 51 samples- 'Observed Effect'. The maximum value is 1.40 mg/l and the lowest 0.23 mg/l.

2-JKS022.78- There are no additional data beyond the 2010 Integrated Report (IR) where elevated TP values greater than 0.20 mg/l are found in two of 12 samples with excessive values at 0.28 and 0.39 mg/l.

2-JKS020.41- A 2007 probability station. Bio 'IM' Two VSCI surveys (2007), average score 48.13. The invertebrate community at this site is dominated by taxa that are tolerant of environments with low dissolved oxygen and high levels of organic pollution (i.e. Tricladida and Asellidae).

2-JKS018.68- Bio 'IM' The 2012 assessment finds from five surveys (2006-2008 & 2010) an average score of 50.37. Five VSCI surveys within the 2010 data window (2004, 2006-2008) have an average score of 54.28. The 2008 assessment reports two VSCI scores from the fall of 2004 (67.3) and 2006 (51.8). The benthic community shows some improvement at this station relative to the station at City Park (2-JKS023.61). However, the benthic community remains dominated by pollution tolerant taxa.

Two total phosphorus observations are elevated within the 2012 data window from 22 samples. Samples greater than 0.20 mg/l are 0.22 and 0.30 mg/l. The 2010 assessment finds two of 16 total phosphorus observations are elevated with excessive values the same as 2012. 2008 assessment TP results find no elevated TP levels above 0.20 mg/l from nine observations (no additional data). The 2006 IR reported six of 18 observations greater than 0.20 mg/l. Elevated TP values ranged from 0.30 to 0.70 mg/l- 'Observed Effect'.

2-JKS013.29- The average VSCI score within the 2012 data window (2006-2008 & 2010) is 54.04. The lowest score is 36.68 (spring 2007) and the highest 61.26 (fall 2006). 2010 results also find an impaired condition with the lowest at 38.6; fall 2004 and the highest 61.26; fall 2006 from six VSCI survey scores (2003, 2004, 2006 & 2007). Lower VSCI scores are the result of the low taxonomic diversity and lack of pollution sensitive taxa. The 2008 IR found impairment from four VSCI surveys (2003 - 2004 & 2006). The Low Moor station through the 2008 assessment has consistently had lower assessment scores and higher numbers of pollution tolerant organisms than at 2-JKS018.68. The 2006 sample showed an increase in pollution sensitive taxa and a decrease in pollution tolerant taxa.

One TP observation from a total of six is greater than 0.20 mg/l at 0.43 mg/L in 2012. There are no additional total phosphorous data within the 2010 data window. 2008 elevated TP samples are found in six of 12 samples with excessive values ranging from 0.29 to 1.41 mg/l- 'Observed Effect'.

2-JKS006.67- Bio 'FS The 2012 assessment finds 'full support' from four VSCI surveys (2007-2008 & 2010) with an average score of 64.1. 2010 results also find 'full support' from six VSCI surveys (2003-2008) with an average score of 61.2. Benthic trend analysis also shows improving conditions (+10 points) over the time period of 1994 - 2010. VSCI scores have increased by 14 points from 2000-2005; and with an additional increase of 11 points from 2006-2010. There have been slight differences in scores over the current six-year period. Spring scores have been lower than fall scores. Lower VSCI scores are the result of the decrease in pollution sensitive taxa. Recent improvements in the benthic community may be due to a reduction in cooling water discharges and efforts to reduce nutrient discharge to the

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river. A recently discovered and repaired sewer line may be responsible for the VSCI decline since 2007. The waters in this portion of the of the original 303(d) Listing (9.81 miles) are de-listed with the 2012 assessment based on VSCI scores from both the 2010 and 2012 assessments, Benthic trend analysis and 2006 / 2012 flow adjusted trend analysis at upstream station 2-JKS023.61 and downstream station 2-JKS000.38.

2-JKS000.38- 2006 and 2012 flow adjusted trend analysis reveals significant declining trends in total phosphorus and total nitrogen at this station. The 2012 Integrated Report (IR) finds no elevated TP observations (greater than 0.20 mg/L) from 36 samples. The 2010 assessment finds a single elevated TP observation from 38 observations at 0.22 mg/l. The 2008 assessment reported elevated TP observations in 15 of 50 observations- 'Observed Effect'. Values above 0.20 mg/l range from 0.22 to 1.24 mg/l.

Assessment Unit / Water Name / Description	Cause Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-I04R_JKS01A00 / Jackson River / Jackson River mainstem from the Westvaco main processing outfall downstream to Dunlap Creek mouth at the watershed boundary with I09R.	4A Benthic-Macroinvertebrate Bioassessments		1996	7/21/2010	0.46

Jackson River

DCR Watershed: I04*

Aquatic Life	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
Benthic-Macroinvertebrate Bioassessments - Total Impaired Size by Water Type:			**0.46**

Sources:

Industrial Point Source Discharge	Municipal (Urbanized High Density Area)	Municipal Point Source Discharges

*Header Information: Location, City/County, Cause/VA Category and Narratives; describe the entire extent of the Impairment. Sizes presented are for Assessment Units (AUs) lying within the DCR Watershed boundary noted above.

James River Basin

Fact Sheet prepared for DCR Watershed: I04*

Cause Group Code: **I09R-01-DO** **Jackson River**

Location: Jackson River mainstem from the Westvaco main processing outfall downstream to just above the Lowmoor community.

City / County: Alleghany Co. Covington City

Use(s): Aquatic Life

Cause(s) /
VA Category: Oxygen, Dissolved/ 5A

The original 1998 IDs, VAW-I04R and VAW-I09R, 1996 303(d) Listed dissolved oxygen impairment was combined into one in 2002 for 11.19 miles.

2010 Assessment station locations are:
2-JKS013.29 - Off Rt. 696 above Lowmoor (I09R)
2-JKS018.68 - Rt. 18 Bridge at Covington (I09R)
2-JKS022.15 - Industrial Park behind Walmart
2-JKS023.61 - City Park - Covington at gage (I09R)

Diurnal swings in dissolved oxygen (DO) cause nonsupport of the aquatic life use for a total of 11.19 miles extending from river mile 24.21 (I04R- 0.46 miles) to 13.02 (I09R- 10.73 miles) (37°46'49.59 / 079°55'40.00").

The DO impairment remains for final determination of Use Support via the TMDL Study. 2012 flow adjusted trend analysis finds a significant increasing trend for dissolved oxygen.

2-JKS023.61- Zero excursions of the 4.0 mg/l minimum DO criterion are found from 46 measurements in 2012 The 2010 assessment reports no DO excursions of the minimum criterion from 48 measurements within the ambient monitoring program. The 2008 assessment also found no DO measurements in excess of the DO minimum criterion from 52 observations. However diurnal effects have been noted in previous assessments. The 2004 IR reports DO exceeds the WQS minimum of 4.0 mg/l in six of 26 1998 special study observations as well as those described below at 2-JKS022.15.

Both the 2006 and 2012 flow adjusted trend analysis reveals significant declining trends in total phosphorus and total nitrogen at 2-JKS023.61. However elevated total phosphorus (TP) levels continue with the 2012 assessment where TP results produce five of 41 samples greater than 0.20 mg/l- 'Observed Effect. Elevated TP samples range from 0.24 to 0.52 mg/l. The 2010 assessment finds six of 40 observations above 0.20 mg/l- 'Observed Effect'. Excessive values range from 0.28 to 0.40 mg/l. 2008 elevated TP levels are found in 17 of 51 samples with a maximum value of 1.40 mg/l and minimum of 0.23 mg/l. 2006 TP concentrations are elevated in 25 of 48 samples with excessive values also ranging from 0.23 to 1.40 mg/l.

2-JKS022.15- 2004 IR reports 1998 DO Recordings find 222 excursions of the minimum 4.0 mg/l WQS criterion from 481 measurements; Diurnal affects are noted. These data are older than 5 years.

2-JKS018.68- Twenty-five DO measurements find no excursions of the 4.0 mg/l minimum criterion within the 2012 data window. No excursions of the minimum criterion are found from 20 observations for the 2010 assessment. DO data within the 2008 data window find no excursions of the 4.0 mg/l minimum criterion from 10 measurements. However diurnal effects have been noted in previous assessments.

2012 TP data greater than 0.20 mg/l are two of 22 measurements.; elevated at 0.22 and 0.30 mg/l. Two of 16 TP samples are elevated above 0.20 mg/l with the 2010 assessment. Excessive values range from 0.22 to 0.30 mg/l. 2008 TP assessment results find no elevated TP levels from nine observations with no additional data beyond the 2006 IR. The 2006 IR reports six of 18 observations in excess of 0.20 mg/l. TP excursions ranged from 0.30 to 0.70 mg/l.

2-JKS013.29- No excursions of the 4.0 mg/l minimum DO criterion are found within the 2012 data window from 9

James River Basin

Fact Sheet prepared for DCR Watershed: I04*

measurements. 2010 DO data report no exceeding values from eight observations. Ambient data within the 2008 assessment data window report no excursions of the WQS minimum criteria for DO. However diurnal effects have been noted in previous assessments.

One elevated TP value (0.43 mg/l) is greater than 0.20 mg/l from nine samples in 2012. Only two TP samples are within the 2010 data window with none greater than 0.20 mg/l. The 2008 IR reports elevated TP above 0.20 mg/l in six of 12 samples with excessive values ranging from 0.29 to 1.41 mg/l- 'Observed Effect'.

Assessment Unit / Water Name / Description	Cause Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-I04R_JKS01A00 / Jackson River / Jackson River mainstem from the Westvaco main processing outfall downstream to Dunlap Creek mouth at the watershed boundary with I09R.	5A Oxygen, Dissolved		1996	2010	0.46

Jackson River

DCR Watershed: I04*

Aquatic Life	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
Oxygen, Dissolved - Total Impaired Size by Water Type:			**0.46**

Sources:

Industrial Point Source Discharge	Municipal Point Source Discharges

*Header Information: Location, City/County, Cause/VA Category and Narratives; describe the entire extent of the Impairment. Sizes presented are for Assessment Units (AUs) lying within the DCR Watershed boundary noted above.

2012 Impaired Waters

Categories 4 and 5 by DCR Watershed*

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

James River Basin

Fact Sheet prepared for DCR Watershed: I04*

Cause Group Code: **I09R-01-PCB** **Jackson River**

Location: The Jackson River from the Covington water intake downstream to just above the Lowmoor community.

City / County: Alleghany Co. Covington City

Use(s): Fish Consumption

Cause(s) / VA Category: PCB in Fish Tissue/ 5A

The 2008 Integrated Report produces the initial 303(d) Listing of these waters for a total of 12.43 miles.

2-JKS023.88 (Covington City Park) 2005 fish tissue collections find exceedances above the former WQS based PCB TV of 54 ppb (VDH 50) from a single species. Two carp are found with tissue values of 66.4 (68.0 cm) and 71.3 ppb (61.31 cm). Application of the new WQS of 20 ppb adds three additional carp sizes (63.9 cm) exceeding at 28.81 ppb, (63.2 cm) at 35.96 and (51-58 cm) at 37.48 ppb.

Assessment Unit / Water Name / Description	Cause	Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-I04R_JKS01A00 / Jackson River / Jackson River mainstem from the Westvaco main processing outfall downstream to Dunlap Creek mouth at the watershed boundary with I09R.	5A	PCB in Fish Tissue		2008	2020	0.46
VAW-I04R_JKS02A00 / Jackson River / Jackson River mainstem from the Covington water intake downstream to Westvaco main processing outfall.	5A	PCB in Fish Tissue		2008	2020	1.24

Jackson River

DCR Watershed: I04*

Fish Consumption

	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
PCB in Fish Tissue - Total Impaired Size by Water Type:			**1.70**

Sources:

Source Unknown

*Header Information: Location, City/County, Cause/VA Category and Narratives; describe the entire extent of the Impairment. Sizes presented are for Assessment Units (AUs) lying within the DCR Watershed boundary noted above.

2012 Impaired Waters

Categories 4 and 5 by DCR Watershed*

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

James River Basin

Fact Sheet prepared for DCR Watershed: I04*

Cause Group Code: **I09R-02-BAC** **Jackson River**

Location: Jackson River mainstem from the Covington water intake downstream to just above the Lowmoor Community.

City / County: Alleghany Co. Covington City

Use(s): Recreation

Cause(s) / VA Category: Escherichia coli/ 5A

The original 3.36 mile waters were 1998 303(d) listed for fecal coliform (FC) bacteria and delisted for bacteria October 2005 as approved by the U.S. EPA (Fed. ID - NA) where only one exceedance from 24 observations are reported via the 2006 Integrated Report (IR) for Escherichia coli (E. coli) bacteria.

The bacteria impairment returned with the 2008 IR based on E. coli excursions at 2-JKS023.61. Data within the 2010 data window results in an additional extension of the impairment from stations 2-JKS018.68 and 2-JKS015.60. The impairment extends a total of 12.43 miles.

2-JKS023.61 (Covington City Park) Seventeen of 37 E.coli samples exceed the 235 cfu/100 ml instantaneous criterion within the 2012 data window. Excessive values range from 250 cfu/100 ml to greater than 2000. 2010 results produce nine of 33 Escherichia coli (E. coli) observations in excess of the instantaneous criterion. Exceeding values range from 320 to 1400 cfu/100 ml. 2008 IR found four of 27 E. coli observations in excess of the instantaneous criterion. Exceeding values range from 250 to 1400 cfu/100 ml.

2-JKS018.68 (Rt. 8 Bridge at Covington) There are no additional E.coli data within the 2012 data window. Three of 12 E. coli observations exceed 235 cfu/100 ml ranging from 550 to 380 cfu/100 ml in 2010.

2-JKS015.60 (K-Mart Parking Lot, SE corner) There are no additional E.coli data within the 2012 data window. 2010 E. coli observations exceed the 235 cfu/100 ml criterion in two of 12 observations. Exceeding values range from 250 to 450 cfu/100 ml.

Assessment Unit / Water Name / Description	Cause	Category / Name	Nested	Cycle First Listed	TMDL Schedule or EPA Approval	Size
VAW-I04R_JKS01A00 / Jackson River / Jackson River mainstem from the Westvaco main processing outfall downstream to Dunlap Creek mouth at the watershed boundary with I09R.	5A	Escherichia coli		2008	2020	0.46
VAW-I04R_JKS02A00 / Jackson River / Jackson River mainstem from the Covington water intake downstream to Westvaco main processing outfall.	5A	Escherichia coli		2008	2020	1.24

Jackson River

DCR Watershed: I04*

Recreation

	Estuary (Sq. Miles)	Reservoir (Acres)	River (Miles)
Escherichia coli - Total Impaired Size by Water Type:			**1.70**

2012 Impaired Waters

Categories 4 and 5 by DCR Watershed*

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

James River Basin

Fact Sheet prepared for DCR Watershed: I04*

Sources:

Municipal (Urbanized High Density Area)	Sanitary Sewer Overflows (Collection System Failures)	Urban Runoff/Storm Sewers

*Header Information: Location, City/County, Cause/VA Category and Narratives; describe the entire extent of the Impairment. Sizes presented are for Assessment Units (AUs) lying within the DCR Watershed boundary noted above.

Benthic TMDL Development for the Jackson River, Virginia

Submitted to

Virginia Department of Environmental Quality

Prepared by

THE Louis Berger Group, INC.
2445 M Street, NW
Washington, DC 20037

June 2010

Final Report

EPA approved 7/21/10
SW CB approved 12/9/10

Executive Summary

Background

This report presents the development of the Jackson River benthic TMDL. The Jackson River originates in Highland County in southwestern Virginia, and extends to the confluence of the Jackson River with the Cowpasture River in Botetourt County, where the two rivers join to form the James River. The Jackson River flows through sections of Alleghany, Bath, Craig, and Highland Counties, as well as the Cities of Covington and Clifton Forge. The Gathright Dam regulates the stream flow in the Jackson River.

The impaired segment on the Jackson River is 24.21 total miles. It is listed for dissolved oxygen and General Standard benthic impairments (DEQ, 2004). The upstream limit of the impaired segment is below the Covington City Water Treatment Plant intake, and its downstream limit is at the confluence of the Jackson and Cowpasture Rivers. The impairments include the following:

- Dissolved oxygen impairment, extending from river mile 24.21 downstream to river mile 13.00 (11.21 miles of the impairment segment).
- General standard benthic impairment, extending from river mile 24.21 to river mile zero, which is the confluence of the Jackson River with the Cowpasture River (24.21 miles of the impairment segment).

Stressor Identification

The stressor identification for the biologically impaired segment of the Jackson River was performed using the available biological and water quality monitoring data. In addition, Discharge Monitoring Reports (DMR) and Nutrient Monitoring Reports (NMR); Toxicity Testing, Whole Effluent Toxicity (WET) data; and special studies were also used in the identification of the stressors on the Jackson River. The stressor identification follows guidelines outlined in the EPA Stressor Identification Guidance (EPA 2000).

The identification of the most probable cause of biological impairment in the Jackson River was based on evaluations of candidate stressors that can potentially impact the river. The 2004 Water Quality Assessment 305(b)/303(d) Integrated Report Fact Sheet identified "nutrient and organic enrichment as possible sources of biological impairment. Therefore, these pollutants were considered in the evaluation of candidate stressors along with other probable stressors such as pH, temperature, dissolved oxygen, sediment, ammonia, flow modification, and toxic compounds. Each candidate stressor was evaluated based on available monitoring data, field observations, and consideration of potential sources in the watershed. Furthermore, potential stressors were classified as a non-stressor, possible stressor, or most probable stressor.

Non-Stressors:

The stressors with data indicating normal conditions and without water quality standard violations, or without any apparent impact, were considered as non-stressors. Based on the data analyzed, temperature, pH, metals, organics and sediment, as well as non-point sources loading under wet-weather flow were eliminated as stressors in the impaired segment of the Jackson River.

Possible Stressors:

The stressors with data indicating possible links, but inconclusive data, are considered as possible stressors. The results indicate that Total Dissolved Solids (TDS) with the associated toxicity, low-dissolved oxygen, and flow modification are possible stressors to the benthic community in the Jackson River.

Most Probable Stressors:

The stressors with the most complete data linking them to the poorer benthic community are considered as most probable stressors. The results indicate that excessive nutrient loading leading to excessive periphyton growth are adversely impacting the biological communities in the impaired segment of the Jackson River.

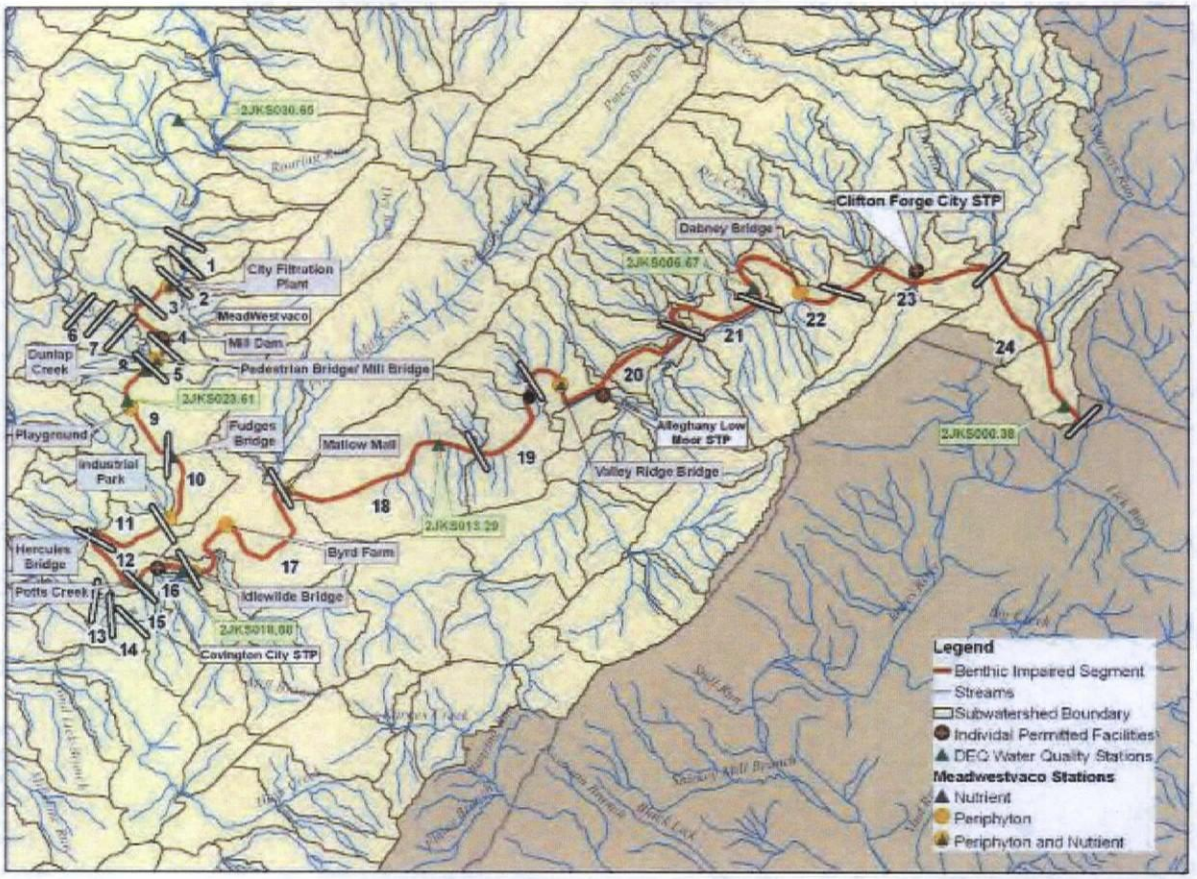

Figure E-1: Jackson River Model Segments

HSPF Model Description

The Hydrologic Simulation Program-Fortran (HSPF) was used to estimate the nutrient nonpoint source loads to the Jackson River. HSPF is a continuous, physically based, lumped-parameter model which simulates hydrology, sediment, and chemical pollutants in the soil and in streams. Nutrient simulation modules are detailed and flexible, and thus can be used to simulate a variety of land use types. The HSPF model is normally calibrated to observed flow and water quality data measured at the outlet of a watershed.

The Chesapeake Bay Program in Annapolis calibrated the HSPF Model over the entire Chesapeake Bay watershed. The model divides the 64,000 square mile Chesapeake Bay drainage basin into model segments. Each segment contains information generated by a

The state regulatory agency for Virginia is the Department of Environmental Quality (DEQ). DEQ works in coordination with the Virginia Department of Conservation and Recreation (DCR), the Department of Mines, Minerals, and Energy (DMME), and the Virginia Department of Health (VDH) to develop and regulate a more effective TMDL process. DEQ is the lead agency for the development of TMDLs statewide and focuses its efforts on all aspects of reduction and prevention of pollution to state waters. DEQ ensures compliance with the Federal Clean Water Act and the Water Quality Planning Regulations, as well as with the Virginia Water Quality Monitoring, Information, and Restoration Act (WQMIRA, passed by the Virginia General Assembly in 1997), and coordinates public participation throughout the TMDL development process. The role of DCR is to initiate non-point source pollution control programs statewide with federal grant money. DMME focuses its efforts on issuing surface mining permits and National Pollution Discharge Elimination System (NPDES) permits for mining operations. Lastly, VDH monitors waters for fecal coliform, classifies waters for shellfish growth and harvesting, and conducts surveys to determine sources of bacterial contamination (DEQ, 2001).

As required by the Clean Water Act and WQMIRA, DEQ develops and maintains a listing of all impaired waters in the state that details the pollutant(s) causing each impairment and the potential source(s) of each pollutant. This list is referred to as the Section 303(d) List of Impaired Waters. In addition to Section 303(d) List development, WQMIRA directs DEQ to develop and implement TMDLs for listed waters (DEQ, 2001a). Once TMDLs have been developed, they are distributed for public comment and then submitted to the EPA for approval.

1.2 Jackson River Description and Impairment Listing

The Jackson River flows through a narrow valley, with mountain peak elevations of approximately 2,500 feet above mean sea level. The headwaters of the Jackson River originate in Highland County in southwestern Virginia, and extend to the confluence of the Jackson River with the Cowpasture River in Botetourt County, where the two rivers join to form the James River. The Jackson River flows through sections of Alleghany,

Bath, and Highland Counties, as well as the City of Covington and Town of Clifton Forge. The Gathright Dam regulates the stream flow in the Jackson River.

The Jackson River was initially listed on Virginia's 1996 Section 303(d) Total Maximum Daily Load Priority List and Report (DEQ, 1996), and was subsequently included on Virginia's 1998 and 2002 Section 303(d) Lists of Impaired Waters (DEQ, 2002) and in the 2004 Water Quality Assessment 305(b)/303(d) Integrated Report (DEQ, 2004).

The impaired segment of the Jackson River, included in the 2004 305(b)/303(d) Integrated Report, is 25.24 miles long, from its upstream limit immediately below the Covington City Water Treatment Plant intake to its downstream limit at the confluence of the Jackson and Cowpasture Rivers. The impairments include the following:

- Dissolved oxygen impairment, extending from river mile 24.21 downstream to river mile 13.00 (11.21 miles of the impairment segment).

- General standard benthic impairment, extending from river mile 24.21 to river mile zero, which is the confluence of the Jackson River with the Cowpasture River (24.21 miles of the impairment segment).

- Bacteria impairment and failure to attain the primary contact recreation and aquatic life uses, extending from river mile 25.24 to river mile 21.86 (3.38 miles of the impairment segment). However, the recent data supplied by the DEQ indicates that the fecal coliform bacteria concentrations are false positive results due to *Klebsiella pneumoniae*. Consequently, EPA concurred that a bacteria TMDL is not required for the Jackson River (Memorandum from Jon Capacasa, Director Water Protection Division EPA Region 3, to Ellen Gilinsky VADEQ, 2005).

Consequently, this report addresses the impaired segment, with a total mileage of 24.21 miles, for General Standard benthic impairments. Figure 1-1 depicts this impaired segment.

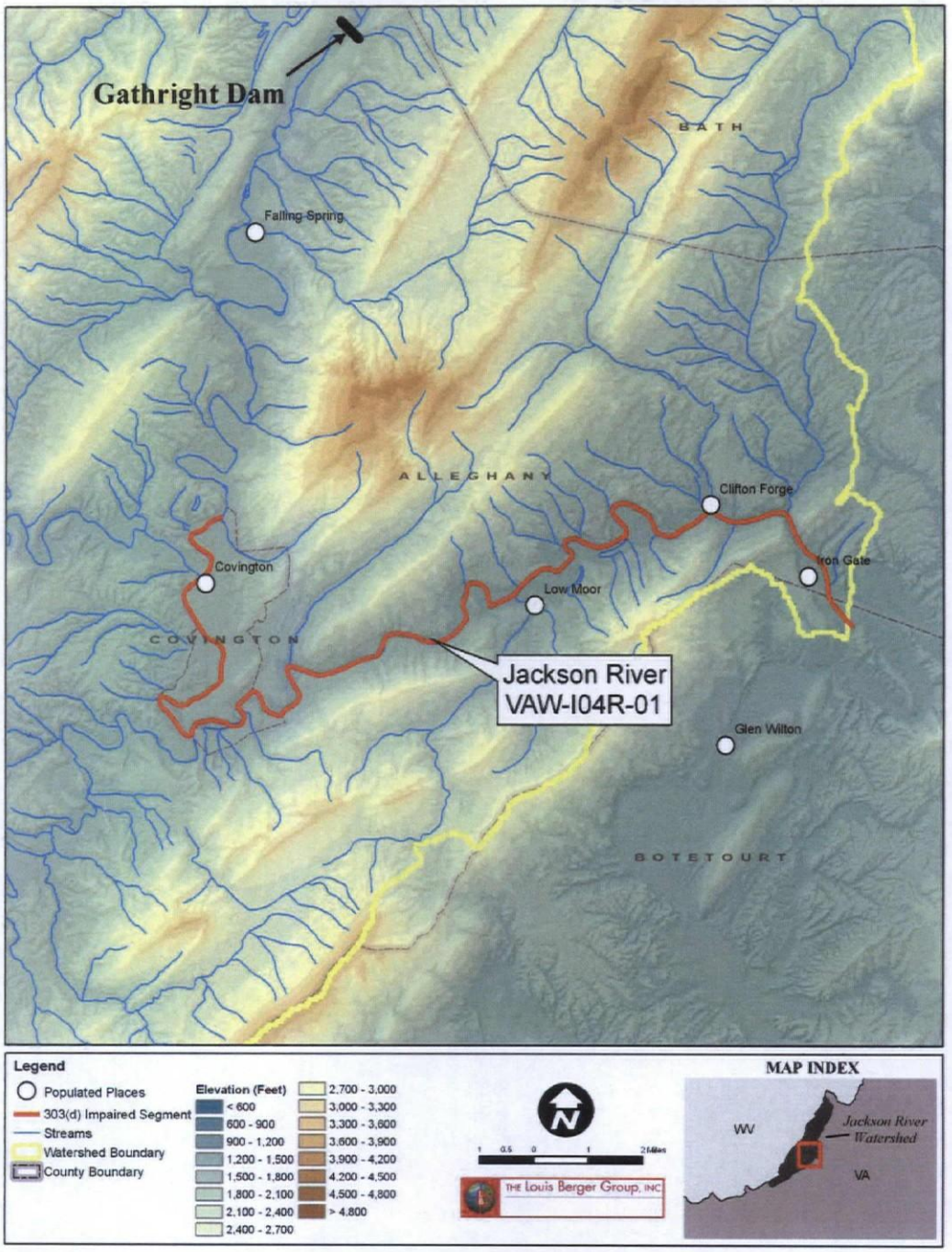

Figure 1-1: Jackson River Location and Benthic Impairment Segment

2.2 Permitted Discharge Facilities

There are 15 facilities holding active individual discharge permits in the Jackson River watershed. The permit number, type, permitted flow, receiving waterbody, and status of each of the facilities holding individual permits are presented in Table 2-5, and their locations are presented in Figure 2-4. There are also a total of 18 general permits in the Jackson River watershed; 11 stormwater permits issued to industrial sites, 3 permits issued to domestic sewage facilities, 2 permits issued to mines, 1 stormwater permit issued to a construction site, and 1 permit issued to a concrete facility. Additional information regarding the general permits is presented in Table 2-6.

Table 2-5: Facilities Holding Individual Permits in the Jackson River Watershed

Permit Number	Facility Name	Facility Type	Design Flow (gpd)[1]	Receiving Waterbody	Status
VA0027979	Alleghany County - Low Moor STP	Municipal	500,000	Jackson River	Active
VA0003450	Applied Extrusion Technologies	Industrial	1,000,000	Jackson River	Active
VA0088544	Boys Home Inc STP	Municipal	24,000	Dunlap Creek	Active
VA0022772	Clifton Forge City STP	Municipal	2,000,000	Jackson River	Active
VA0006076	Clifton Forge Water Treatment Plant	Industrial	50,000	Smith Creek	Active
VA0025542	Covington City STP	Municipal	3,000,000	Jackson River	Active
VA0003344	CSX Transportation Inc - Clifton Forge	Industrial	25,000	Jackson River	Active
VA0091324	DGIF Paint Bank Fish Cultural Station	Industrial	2,900,000	Paint Bank Branch	Active
VA0003646	MeadWestvaco Packaging Resource Group	Industrial	35,000,000	Jackson River	Active
VA0032115	Morris Hill STP	Municipal	15,000	Jackson River	Active
VA0002984	Parker Hannifin Powertrain Division	Industrial	208,000	Jackson River	Inactive
VA0088552	Sponaugle Subdivision	Municipal	16,000	Jackson River	Active
VA0090646	Tanglewood Manor Home for Adults	Municipal	18,000	Ogle Creek	Active
VA0075574	VDOT I64 Rest Area - Alleghany County	Municipal	15,000	Jerry's Run	Active
VA0090671	Alleghany Co - Lower Jackson River WWTP	Municipal	2,000,000	Jackson River	Inactive

1: Gallons per Day

Table 7-9: Total Nitrogen and Total Phosphorus Waste Load Allocations Minor Industrial Facilities				
Permit Number	**Facility Name**	**Design Flow (gpd)**	**TP Load (lbs/growing season)**	**TN Load (lbs/growing season)**
VA0003450	Applied Extrusion Technologies	1,000,000	178.4	395.0
VA0006076	Clifton Forge Water Treatment Plant	50,000	8.9	19.7
VA0003344	CSX Transportation Inc - Clifton Forge	25,000	4.5	9.9
VA0091324	DGIF Paint Bank Fish Cultural Station	2,900,000	517.3	1145.4
		Total	**709**	**1,570**

The nutrient allocations for the 5 minor municipal dischargers are developed using recommended literature values related to primary treatment levels for total phosphorus (10 mg/L) and total nitrogen (40 mg/L) (Thomann, 1987). **Table 7-10** presents the WLAs for the 5 minor municipal facilities for total phosphorus and total nitrogen respectively.

Table 7-10: Total Phosphorus Waste Load Allocations – Minor Municipal Facilities				
Permit Number	**Facility Name**	**Design Flow (gpd)**	**TP (lbs/growing season)**	**TN (lbs/growing season)**
VA0088544	Boys Home Inc STP	24,000	305.8	1223.1
VA0032115	Morris Hill STP	15,000	191.1	764.4
VA0088552	Sponaugle Subdivision	16,000	203.9	815.4
VA0090646	Tanglewood Manor Home for Adults	18,000	229.3	917.3
VA0075574	VDOT I64 Rest Area - Alleghany County	15,000	191.1	764.4
			1,121.2	**4,484.8**

There are also 18 general permits in the Jackson River watershed; 3 permits issued to domestic sewage facilities 11 stormwater permits issued to industrial sites, 2 permits issued to mines, 1 stormwater permit issued to a construction site, and 1 stormwater permit issued to a concrete facility.

The WLA for the domestic sewage facilities were developed using similar nutrient discharge assumption as the one used the minor municipal facilities along with a maximum discharge flow of 1,000 gallons per day. **Table 7-11** presents the total phosphorus and total nitrogen WLAs for the 3 domestic sewage facilities.

NOTE: (1) Shenandoah Co. - North Fork Regional WWTP: waste load allocations (WLAs) based on a design flow capacity of 0.75 million gallons per day (MGD). If plant is not certified to operate at 0.75 MGD design flow capacity by 12/31/10, the WLAs will be deleted and facility removed from Significant Discharger List.

(2) Harrisonburg-Rockingham Regional S.A.-North River STP: waste load allocations (WLAs) based on a design flow capacity of 20.8 million gallons per day (MGD). If plant is not certified to operate at 20.8 MGD design flow capacity by 12/31/10, the WLAs will decrease to TN = 194,916 lbs/yr; TP = 14,619 lbs/yr, based on a design flow capacity of 16.0 MGD.

(3) Mount Jackson STP: waste load allocations (WLAs) based on a design flow capacity of 0.7 million gallons per day (MGD). If plant is not certified to operate at 0.7 MGD design flow capacity by 12/31/10, the WLAs will decrease to TN = 7,309 lbs/yr; TP = 548 lbs/yr, based on a design flow capacity of 0.6 MGD.

(4) Purcellville-Basham Simms STP: waste load allocations (WLAs) based on a design flow capacity of 1.5 million gallons per day (MGD). If plant is not certified to operate at 1.5 MGD design flow capacity by 12/31/10, the WLAs will decrease to TN = 12,182 lbs/yr; TP = 914 lbs/yr, based on a design flow capacity of 1.0 MGD.

(5) Loudoun Co. S.A.-Broad Run WRF: waste load allocations (WLAs) based on a design flow capacity of 11.0 million gallons per day (MGD). If plant is not certified to operate at 11.0 MGD design flow capacity by 12/31/10, the WLAs will decrease to TN = 121,822 lbs/yr; TP = 3,046 lbs/yr, based on a design flow capacity of 10.0 MGD.

(6) Dale Service Corp.-Section 1 WWTF: waste load allocations (WLAs) based on a design flow capacity of 4.6 million gallons per day (MGD). If plant is not certified to operate at 4.6 MGD design flow capacity by 12/31/10, the WLAs will decrease to TN = 36,547 lbs/yr; TP = 2,193 lbs/yr, based on a design flow capacity of 4.0 MGD.

(7) Dale Service Corp.-Section 8 WWTF: waste load allocations (WLAs) based on a design flow capacity of 4.6 million gallons per day (MGD). If plant is not certified to operate at 4.6 MGD design flow capacity by 12/31/10, the WLAs will decrease to TN = 36,547 lbs/yr; TP = 2,193 lbs/yr, based on a design flow capacity of 4.0 MGD.

(8) Fauquier Co. W&SA-Vint Hill STP: waste load allocations (WLAs) based on a design flow capacity of 0.95 million gallons per day (MGD). If plant is not certified to operate at 0.95 MGD design flow capacity by 12/31/10, the WLAs will decrease to TN = 5,482 lbs/yr; TP = 548 lbs/yr, based on a design flow capacity of 0.6 MGD.

(9) Parkins Mill STP: waste load allocations (WLAs) based on a design flow capacity of 5.0 million gallons per day (MGD). If plant is not certified to operate at 5.0 MGD design flow capacity by 12/31/10, the WLAs will decrease to TN = 36,547 lbs/yr; TP = 2,741 lbs/yr, based on a design flow capacity of 3.0 MGD.

9 VAC 25-720-60. James River Basin. Water Quality Management Planning Regulation 4/24/03

A. Total Maximum Daily Load (TMDLs).

TMDL #	Stream Name	TMDL Title	City/ County	WBID	Pollutant	WLA	Units
1.	Pheasanty Run	Benthic TMDL Reports for Six Impaired Stream Segments in the Potomac-Shenandoah and James River Basins	Bath	I14R	Organic Solids	1,231.00	LB/YR
2.	Wallace Mill Stream	Benthic TMDL Reports for Six Impaired Stream Segments in the Potomac-Shenandoah and James River Basins	Augusta	I32R	Organic Solids	2,814.00	LB/YR
3.	Montebello Spring Branch	Benthic TMDL Reports for Six Impaired Stream Segments in the Potomac-Shenandoah and James River Basins	Nelson	H09R	Organic Solids	37.00	LB/YR
4.	Unnamed Tributary to Deep Creek	General Standard Total Maximum Daily Load For Unnamed Tributary to Deep Creek	Nottoway	J11R	Raw Sewage	0	GAL/ YR
5.	Unnamed Tributary to Chickahominy River	Total Maxiumum Daily Load (TMDL) Development for the Unnamed Tributary to the Chickahominy River	Hanover	G05R	Total Phosphorus	409.35	LB/YR

B. Stream segment classifications, effluent limitations including water quality based effluent limitations, and waste load allocations.

TABLE B1 - UPPER JAMES RIVER BASIN RECOMMENDED SEGMENT CLASSIFICATION

Stream Name	Segment No.	Mile to Mile	Classification	Comments
Maury River	2-4	80.3-0.0	E.L.	Main & tributaries
James River	2-5	271.5-266.0	W.Q.	Main only
James River	2-6	266.0-115.0	E.L.	Main & tributaries except Tye & Rivanna River
Tye River	2-7	41.7-0.0	E.L.	Main & tributaries except Rutledge Creek
Rutledge Creek	2-8	3.0-0.0	W.Q.	Main only
Piney River	2-9	20.6-0.0	E.L.	Main & tributaries
Rivanna River	2-10	20.0-0.0	E.L.	Main & tributaries
Rivanna River	2-11	38.1-20.0	W.Q.	Main only
Rivanna River	2-12	76.7-38.1	E.L.	Main & tributaries
S.F. Rivanna River	2-13	12.2-0.0	E.L.	Main & tributaries
Mechum River	2-14	23.1-0.0	E.L.	Main & tributaries
N.F. Rivanna River	2-15	17.0-0.0	E.L.	Main & tributaries except Standardsville Run
Standardsville Run	2-16	1.2-0.0	W.Q.	Main only
Appomattox River	2-17	156.2-27.7	E.L.	Main & tributaries except Buffalo Creek, Courthouse Branch, and Deep Creek
Buffalo Creek	2-18	20.9-0.0	E.L.	Main & tributaries except Unnamed Tributary @ R.M. 9.3
Unnamed Tributary of Buffalo Creek @ R.M. 9.3	2-19	1.3-0.0	W.Q.	Main only
Courthouse Branch	2-20	0.6-0.0	W.Q.	Main only
Deep Creek	2-21	29.5-0.0	E.L.	Main & tributaries except Unnamed Tributary @ R.M. 25.0
Unnamed Tributary of Deep Creek @ R.M. 25.0	2-22	2.2-0.0	W.Q.	Main only

TABLE B2 - UPPER JAMES RIVER BASIN LOAD ALLOCATIONS BASED ON EXISTING DISCHARGE POINT[7]

Stream Name	Segment Number	Classification	Mile to Mile	Significant Discharges	Total Assimilative Capacity of Stream BOD_5 lbs/day	Wasteload Allocation BOD_5 lbs/day[2]	Reserve BOD_5 lbs/day[5]
Cedar Creek	2-3	E.L.	1.9-0.0	Natural Bridge, Inc. STP	35.0	28.0	7.0 (20%)
Elk Creek	2-3	E.L.	2.8-0.0	Natural Bridge Camp for Boys STP	7.0	3.3	3.7 (53%)
Little Calfpasture River	2-4	E.L.	10.9-4.0	Craigsville	12.0	9.6	2.4 (20%)
Cabin River	2-4	E.L.	1.7-0.0	Millboro	Self -sustaining	None	None
Maury River	2-4	E.L.	19.6-12.2	Lexington STP	380.0	380.0	None
Maury River	2-4	E.L.	12.2-1.2	Georgia Bonded Fibers	760.0	102.0[3]	238.0 (31%)
				Buena Vista STP		420.0	

Back Creek	2-1	16.06-8.46	W.Q.	Main Only
Jackson River	2-1	95.70-24.90	E.L.	Main and Tributaries
Jackson River	2-2	24.90-0.00	W.Q.	Main Only
Jackson River	2-2	24.90-0.00	E.L.	Tributaries Only
James River	2-3	349.50-308.50	E.L.	Main and Tributaries
James River	2-3	308.50-279.41	E.L.	Main and Tributaries

TABLE B5 - UPPER JAMES-JACKSON RIVER SUBAREA WASTELOAD ALLOCATIONS BASED ON EXISTING DISCHARGE POINT[1]

MAP LOCATION	STREAM NAME	SEGMENT NUMBER	SEGMENT CLASSIFICATION STANDARDS	MILE to[2] MILE	DISCHARGER	VPDES PERMIT NUMBER	VPDES PERMIT LIMITS BOD_5 kg/day	303(e)[3] WASTELOAD ALLOCATION BOD_5 kg/day
1	Jackson River	2-1	E.L.	93.05-	Virginia Trout	VA0071722	N/A	Secondary
B	Warm Springs Run	2-1	E.L.	3.62-0.00	Warm Springs STP	VA0028233	9.10	Secondary
3	Back Creek	2-1	W.Q.	16.06-8.46	VEPCO	VA0053317	11.50	11.50
C	X-trib to Jackson River	2-1	E.L.	0.40-0.0	Bacova	VA0024091	9.10	Secondary
D	Hot Springs Run	2-1	E.L.	5.30-0.00	Hot Springs Reg. STP	VA0066303	51.10	Secondary
E	X-trib to Cascades Creek	2-1	E.L.	3.00-0.00	Ashwood-Healing Springs STP	VA0023726	11.30	Secondary
F	Jackson River	2-1	E.L.	50.36-	U.S. Forest Service Bolar Mountain	VA0032123	1.98	Secondary
G	Jackson River	2-1	E.L.	43.55	U.S. Army COE Morris Hill Complex	VA0032115	1.70	Secondary
H	Jackson River	2-1	E.L.	29.84-	Alleghany County Clearwater Park	VA0027955	5.70	Secondary
4	Jackson River	2-1	E.L.	25.99	Covington City Water Treatment Plant	VA0058491	N/A	Secondary
5	Jackson River	2-2	W.Q.	24.64-19.03	Westvaco	VA0003646	4,195.00	4,195.00[4]
6					Covington City[5] Asphalt Plant	VA0054411	N/A	N/A
7					Hercules, Inc[6]	VA0003450	94.00	94.00

Attachment F

Wasteload and Limit Calculations

- **Mixing Zone Calculations (MIXER 2.1)**
- **Effluent Data**
- **Antidegradation Wasteload Allocation Spreadsheet**
- **STATS Program Results (ammonia, TRC)**

Mixing Zone Predictions for Morrris Hill STP

Effluent Flow = 0.015 MGD
Stream 7Q10 = 92.0 MGD
Stream 30Q10 = 91.1 MGD
Stream 1Q10 = 92.5 MGD
Stream slope = 0.008 ft/ft
Stream width = 175 ft
Bottom scale = 3
Channel scale = 1

Mixing Zone Predictions @ 7Q10

Depth = .7905 ft
Length = 35356.71 ft
Velocity = 1.0296 ft/sec
Residence Time = .3975 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 7Q10 may be used.

Mixing Zone Predictions @ 30Q10

Depth = .7859 ft
Length = 35532.71 ft
Velocity = 1.0256 ft/sec
Residence Time = .401 days

Recommendation:

A complete mix assumption is appropriate for this situation and the entire 30Q10 may be used.

Mixing Zone Predictions @ 1Q10

Depth = .7931 ft
Length = 35260.18 ft
Velocity = 1.0318 ft/sec
Residence Time = 9.4922 hours

Recommendation:

A complete mix assumption is appropriate for this situation providing no more than 10.53% of the 1Q10 is used.

Morris Hill STP
VPDES Permit No. VA0032115

Effluent Flow (Outfall 001)

Date Due	Monthly Ave. (MGD)	Weekly Ave. (MGD)
10-Nov-09	0.0018	0.0018
10-Dec-09	0.0014	0.0018
10-Jan-10	0.0034	0.0063
10-Feb-10	0.0015	0.002
10-Mar-10	0.0013	0.0024
10-Apr-10	0.002	0.0036
10-May-10	0.0018	0.0018
10-Jun-10	0.0018	0.0018
10-Jul-10	0.0017	0.0018
10-Aug-10	0.0018	0.0018
10-Sep-10	0.0018	0.0018
10-Oct-10	0.0018	0.0018
10-Nov-10	0.0018	0.0018
10-Dec-10	0.0018	0.0018
10-Jan-11	0.0018	0.0018
10-Feb-11	0.0018	0.0018
10-Mar-11	0.0018	0.0018
10-Apr-11	0.0018	0.0018
10-May-11	**0.0033**	**0.018**
10-Jun-11	0.002	0.0036
10-Jul-11	0.0019	0.0044
10-Aug-11	0.0018	0.0018
10-Sep-11	0.0018	0.0018
10-Oct-11	0.0018	0.0018
10-Nov-11	0.0018	0.0018
10-Dec-11	0.0018	0.0018
10-Jan-12	0.0018	0.0018
10-Mar-12	0.0018	0.0018
10-Apr-12	0.0018	0.0018
10-May-12	0.0018	0.0054
10-Jun-12	0.0018	0.0054
10-Jul-12	0.0018	0.0018
10-Aug-12	0.0018	0.0018
10-Sep-12	0.0018	0.0018
10-Oct-12	0.0018	0.0018
10-Nov-12	0.0018	0.0018
10-Feb-13	0.0018	0.0018
10-Mar-13	0.0018	0.0018
10-Apr-13	0.0018	0.0018
10-May-13	0.0018	0.0018
10-Jun-13	0.0018	0.0018
10-Jul-13	0.0018	0.0018
10-Aug-13	0.0018	0.0018
10-Sep-13	0.0018	0.0018
10-Oct-13	0.0018	0.0018
10-Nov-13	0.0018	0.0018
10-Feb-14	0.0018	0.0018
10-Mar-14	0.0018	0.0018
Maximum Flow	**0.0034**	**0.018**
Design Flow	**0.015**	

VAW-I04R
2-JKS030.65

Collection Date Time	Temp Celsius	Field pH (S.U.)
01/24/2006 12:00	5.9	7.7
03/30/2006 12:00	8.6	7.5
05/01/2006 12:30	13.3	7.6
07/31/2006 13:00	18.6	7.3
09/07/2006 13:00	17.6	8.2
11/14/2006 10:30	11	7.8
01/10/2007 11:30	7.2	7.1
03/22/2007 11:30	8.3	7.6
05/15/2007 13:00	13.9	7.5
07/26/2007 11:30	17.4	7.6
11/19/2007 13:00	10	7.3
01/08/2008 12:30	7.8	7.4
03/13/2008 12:30	9	7
03/25/2008 12:30	7.8	6.9
05/07/2008 12:00	10	7.1
07/29/2008 12:30	17.7	8.2
09/22/2008 12:00	15.2	8
11/24/2008 11:00	4.9	8.3
01/22/2009 13:00	1.4	7.9
03/11/2009 12:30	9	7.8
05/05/2009 13:30	8.5	7.4
07/07/2009 12:00	17	8.1
09/02/2009 13:00	16.5	8
11/30/2009 12:30	12	7.8
02/24/2010 11:25	4.2	7.6
04/01/2010 12:15	8.5	7.9
06/16/2010 13:10	18.7	7.8
08/16/2010 12:45	18.6	8
10/26/2010 12:05	15.4	7.9
12/29/2010 12:10	2	8.2
02/16/2011 11:00	4.1	8
04/19/2011 13:35	9.3	7.8
06/22/2011 12:20	18.1	7.7
08/16/2011 13:40	17.6	8
09/27/2011 10:40	16.6	7.7
09/28/2011 12:10	15.8	8.1
10/12/2011 13:55	15.6	8
12/28/2011 13:20	7.8	7.9
02/22/2012 13:15	6.7	7.6
03/08/2012 12:40	8.3	7.7
05/24/2012 13:30	16.3	8.2
07/05/2012 12:40	18.7	8.1
09/05/2012 14:15	18.7	8
11/27/2012 13:00	9.5	8.2
01/09/2013 11:55	4.6	7.7
02/05/2013 10:05	5.1	7.6
03/12/2013 13:45	6.2	7.7
04/02/2013 11:35	6.4	7.6
05/20/2013 10:50	14.9	8
06/18/2013 12:20	15.6	7.9
07/23/2013 11:40	16.8	7.6
08/13/2013 12:15	15.9	7.6
09/09/2013 13:05	16.7	7.8
10/02/2013 13:50	17.1	8.1
11/06/2013 12:30	14	7.8
12/16/2013 12:50	6	8
02/05/2014 11:40	4.4	7.5

90th Percentile Temp	18 °C	
90th Percentile Temp	13 °C	(Dec. - May)
90th Percentile pH	8.1 S.U.	
10th Percentile pH	7.4 S.U.	

Morris Hill WWTP
VA0032115

Date	Temp
07/16/09	21.2
07/23/09	21.4
08/06/09	19.3
08/13/09	20.6
08/20/09	19.6
08/31/09	18.4
09/07/09	18.4
09/21/09	18.4
10/04/09	15.9
11/11/09	14.7
12/07/09	9.1
01/05/10	4.1
02/19/10	6.5
03/11/10	11.5
03/23/10	13.8
04/14/10	14.2
05/10/10	16.0
05/27/10	15.8
06/03/10	20.6
06/10/10	20
06/16/10	21.2
06/23/10	20.6
06/25/10	21.1
07/04/10	21.4
07/07/10	22.5
07/13/10	21.5
07/21/10	22.8
07/25/10	22.7
08/05/10	22.5
08/11/10	22.1
08/15/10	22.3
08/23/10	21.4
08/26/10	20.4
09/03/10	21.4
09/07/10	21.1
10/01/10	17.5
10/07/10	15.1
12/05/10	9.1

Date	Temp
01/26/11	7.3
02/22/11	7.5
03/06/11	6.6
03/11/11	6.7
03/22/11	6.6
03/31/11	6.7
04/05/11	14.1
04/11/11	14.5
04/19/11	13.4
04/28/11	18.3
05/02/11	18.4
05/11/11	16.8
05/19/11	16.3
06/03/11	18.8
06/21/11	20.6
06/27/11	20.5
07/07/11	22.3
07/12/11	21.9
07/19/11	20.3
07/26/11	20.4
08/10/11	22.4
08/17/11	22.2
08/23/11	19.4
09/08/11	19.5
09/13/11	18.5
10/20/11	12.6
11/17/11	12.4
12/15/11	9.3
01/24/12	9.2
02/23/12	9.4
03/22/12	15.1
04/24/12	14.5
05/04/12	16.5
05/15/12	18.6
05/24/12	16.4
06/04/12	18.7
06/17/12	18.8
06/28/12	18.6
07/10/12	20.6
07/24/12	21.9
08/23/12	20.3
09/11/12	18.9
09/21/12	17.4
10/18/12	14.4

Date	Temp
01/13/13	11.2
02/23/13	7.5
03/19/13	9.6
03/27/13	8.4
04/16/13	9.3
05/09/13	15.8
05/16/13	17.8
05/23/13	17.4
05/28/13	17.9
06/09/13	21.3
06/17/13	21.5
06/25/13	20.7
07/18/13	22.7
07/29/13	22.0
08/15/13	17.7
08/23/13	20.6
09/20/13	19.3
10/09/13	13.1
10/24/13	13.5

90th Percentile Temp	22 °C	
90th Percentile Temp	18 °C	(Dec. - May)

Water Chemistry, Inc.
3404 Aerial Way Drive • Roanoke, VA 24018
Phone (540) 343-3618 • Fax (540) 342-2054

Certificate of Analysis

U.S. Army Corps of Engineers
Rt. 605 Coles Mountain Road

Covington **VA** **24426**

Date Reported: February 26, 2014

Sample Code: 14-0396

Chain of Custody Information

Date Collected:	February 25, 2014	**Date Received:**	February 25, 2014
Time Collected:	0900	**Time Received:**	1120
Collected By:	Timothy Flanagan	**Sample Type:**	Waste Water
Collection Method:	Grab		
Sample Description:			

Project Name: MPN

Analytical Notes: *Sample received to WCI >6°C. Sample not received on ice. Results may not be in compliance for VPDES reporting.

Project Notes: QL=Level of Quantitation

Analytical Data and Quality Assurance Information

Sample Code: 14-0396

Parameter	Result	QL	Method	Date/Time	Analyst
E. Coli*	1 MPN/100 mL	1 MPN/100 mL	Colilert MPN	02/25/14 1150	JLA

Test results meet all requirements of NELAC unless otherwise indicated. Analytical data meet precision and accuracy criteria established by the U.S.E.P.A. for drinking water, waste water, and solid wastes. Exceptions are noted in the analytical notes section of the certificate of analysis. Handling, preservation and collection of samples are performed according to E.P.A. protocol and 40 CFR part 136 and/or 141 and amendments. Reproduction of this report is not permitted, except in full, without written approval from Water Chemistry, Inc. The results on this report relate only to the sample(s) provided for analysis.

VELAP ID: 460020

Judith Ge Joseph Aldridge
Laboratory Technician

FRESHWATER
WATER QUALITY CRITERIA / WASTELOAD ALLOCATION ANALYSIS

Facility Name: Morris Hill STP Permit No.: VA0032115

Receiving Stream: Jackson River Version: OWP Guidance Memo 00-2011 (8/24/00)

Stream Information

Mean Hardness (as CaCO3) =	82.2	mg/L
90% Temperature (Annual) =	18	deg C
90% Temperature (Wet season) =	13	deg C
90% Maximum pH =	8.1	SU
10% Maximum pH =	7.4	SU
Tier Designation (1 or 2) =	2	
Public Water Supply (PWS) Y/N? =	n	
Trout Present Y/N? =	n	
Early Life Stages Present Y/N? =	y	

Stream Flows

1Q10 (Annual) =	92.5	MGD
7Q10 (Annual) =	92	MGD
30Q10 (Annual) =	91.1	MGD
1Q10 (Wet season) =	90.3	MGD
30Q10 (Wet season)	85.7	MGD
30Q5 =	90.1	MGD
Harmonic Mean =	70.7	MGD

Mixing Information

Annual - 1Q10 Mix =	10.53	%
- 7Q10 Mix =	100	%
- 30Q10 Mix =	100	%
Wet Season - 1Q10 Mix =	100	%
- 30Q10 Mix =	100	%

Effluent Information

Mean Hardness (as CaCO3) =	82.2	mg/L
90% Temp (Annual) =	22	deg C
90% Temp (Wet season) =	18	deg C
90% Maximum pH =	8	SU
10% Maximum pH =	7.2	SU
Discharge Flow =	0.015	MGD

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Acenapthene	0	--	--	na	9.9E+02	--	--	na	5.9E+06	--	--	na	9.9E+01	--	--	na	5.9E+05	--	--	na	5.9E+05
Acrolein	0	--	--	na	9.3E+00	--	--	na	5.6E+04	--	--	na	9.3E-01	--	--	na	5.6E+03	--	--	na	5.6E+03
Acrylonitrile [C]	0	--	--	na	2.5E+00	--	--	na	1.2E+04	--	--	na	2.5E-01	--	--	na	1.2E+03	--	--	na	1.2E+03
Aldrin [C]	0	3.0E+00	--	na	5.0E-04	2.0E+03	--	na	2.4E+00	7.5E-01	--	na	5.0E-05	4.6E+03	--	na	2.4E-01	2.0E+03	--	na	2.4E-01
Ammonia-N (mg/l) (Yearly)	0	6.95E+00	1.68E+00	na	--	4.5E+03	1.0E+04	na	--	1.74E+00	4.19E-01	na	--	1.1E+04	2.5E+03	na	--	4.5E+03	2.5E+03	na	--
Ammonia-N (mg/l) (High Flow)	0	6.95E+00	2.10E+00	na	--	4.2E+04	1.2E+04	na	--	1.74E+00	5.24E-01	na	--	1.0E+04	3.0E+03	na	--	1.0E+04	3.0E+03	na	--
Anthracene	0	--	--	na	4.0E+04	--	--	na	2.4E+08	--	--	na	4.0E+03	--	--	na	2.4E+07	--	--	na	2.4E+07
Antimony	0	--	--	na	6.4E+02	--	--	na	3.8E+06	--	--	na	6.4E+01	--	--	na	3.8E+05	--	--	na	3.8E+05
Arsenic	0	3.4E+02	1.5E+02	na	--	2.2E+05	9.2E+05	na	--	8.5E+01	3.8E+01	na	--	5.2E+05	2.3E+05	na	--	2.2E+05	2.3E+05	na	--
Barium	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Benzene [C]	0	--	--	na	5.1E+02	--	--	na	2.4E+06	--	--	na	5.1E+01	--	--	na	2.4E+05	--	--	na	2.4E+05
Benzidine [C]	0	--	--	na	2.0E-03	--	--	na	9.4E+00	--	--	na	2.0E-04	--	--	na	9.4E-01	--	--	na	9.4E-01
Benzo (a) anthracene [C]	0	--	--	na	1.8E-01	--	--	na	8.5E+02	--	--	na	1.8E-02	--	--	na	8.5E+01	--	--	na	8.5E+01
Benzo (b) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	8.5E+02	--	--	na	1.8E-02	--	--	na	8.5E+01	--	--	na	8.5E+01
Benzo (k) fluoranthene [C]	0	--	--	na	1.8E-01	--	--	na	8.5E+02	--	--	na	1.8E-02	--	--	na	8.5E+01	--	--	na	8.5E+01
Benzo (a) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	8.5E+02	--	--	na	1.8E-02	--	--	na	8.5E+01	--	--	na	8.5E+01
Bis2-Chloroethyl Ether [C]	0	--	--	na	5.3E+00	--	--	na	2.5E+04	--	--	na	5.3E-01	--	--	na	2.5E+03	--	--	na	2.5E+03
Bis2-Chloroisopropyl Ether	0	--	--	na	6.5E+04	--	--	na	3.9E+08	--	--	na	6.5E+03	--	--	na	3.9E+07	--	--	na	3.9E+07
Bis 2-Ethylhexyl Phthalate [C]	0	--	--	na	2.2E+01	--	--	na	1.0E+05	--	--	na	2.2E+00	--	--	na	1.0E+04	--	--	na	1.0E+04
Bromoform [C]	0	--	--	na	1.4E+03	--	--	na	6.6E+06	--	--	na	1.4E+02	--	--	na	6.6E+05	--	--	na	6.6E+05
Butylbenzylphthalate	0	--	--	na	1.9E+03	--	--	na	1.1E+07	--	--	na	1.9E+02	--	--	na	1.1E+06	--	--	na	1.1E+06
Cadmium	0	3.1E+00	9.7E-01	na	--	2.0E+03	6.0E+03	na	--	7.9E-01	2.4E-01	na	--	4.8E+03	1.5E+03	na	--	2.0E+03	1.5E+03	na	--
Carbon Tetrachloride [C]	0	--	--	na	1.6E+01	--	--	na	7.5E+04	--	--	na	1.6E+00	--	--	na	7.5E+03	--	--	na	7.5E+03
Chlordane [C]	0	2.4E+00	4.3E-03	na	8.1E-03	1.6E+03	2.6E+01	na	3.8E+01	6.0E-01	1.1E-03	na	8.1E-04	3.7E+03	6.6E+00	na	3.8E+00	1.6E+03	6.6E+00	na	3.8E+00
Chloride	0	8.6E+05	2.3E+05	na	--	5.6E+08	1.4E+09	na	--	2.2E+05	5.8E+04	na	--	1.3E+09	3.5E+08	na	--	5.6E+08	3.5E+08	na	--
TRC	0	1.9E+01	1.1E+01	na	--	1.2E+04	6.7E+04	na	--	4.8E+00	2.8E+00	na	--	2.9E+04	1.7E+04	na	--	1.2E+04	1.7E+04	na	--
Chlorobenzene	0	--	--	na	1.6E+03	--	--	na	9.6E+06	--	--	na	1.6E+02	--	--	na	9.6E+05	--	--	na	9.6E+05

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Chlorodibromomethane[C]	0	--	--	na	1.3E+02	--	--	na	6.1E+05	--	--	na	1.3E+01	--	--	na	6.1E+04	--	--	na	6.1E+04
Chloroform	0	--	--	na	1.1E+04	--	--	na	6.6E+07	--	--	na	1.1E+03	--	--	na	6.6E+06	--	--	na	6.6E+06
2-Chloronaphthalene	0	--	--	na	1.6E+03	--	--	na	9.6E+06	--	--	na	1.6E+02	--	--	na	9.6E+05	--	--	na	9.6E+05
2-Chlorophenol	0	--	--	na	1.5E+02	--	--	na	9.0E+05	--	--	na	1.5E+01	--	--	na	9.0E+04	--	--	na	9.0E+04
Chlorpyrifos	0	8.3E-02	4.1E-02	na	--	5.4E+01	2.5E+02	na	--	2.1E-02	1.0E-02	na	--	1.3E+02	6.3E+01	na	--	5.4E+01	6.3E+01	na	--
Chromium III	0	4.9E+02	6.3E+01	na	--	3.2E+05	3.9E+05	na	--	1.2E+02	1.6E+01	na	--	7.5E+05	9.7E+04	na	--	3.2E+05	9.7E+04	na	--
Chromium VI	0	1.6E+01	1.1E+01	na	--	1.0E+04	6.7E+04	na	--	4.0E+00	2.8E+00	na	--	2.5E+04	1.7E+04	na	--	1.0E+04	1.7E+04	na	--
Chromium, Total	0	--	--	1.0E+02	--	--	--	na	--	--	--	1.0E+01	--	--	--	6.0E+04	--	--	--	na	--
Chrysene [C]	0	--	--	na	1.8E-02	--	--	na	8.5E+01	--	--	na	1.8E-03	--	--	na	8.5E+00	--	--	na	8.5E+00
Copper	0	1.1E+01	7.6E+00	na	--	7.3E+03	4.6E+04	na	--	2.8E+00	1.9E+00	na	--	1.7E+04	1.2E+04	na	--	7.3E+03	1.2E+04	na	--
Cyanide, Free	0	2.2E+01	5.2E+00	na	1.6E+04	1.4E+04	3.2E+04	na	9.6E+07	5.5E+00	1.3E+00	na	1.6E+03	3.4E+04	8.0E+03	na	9.6E+06	1.4E+04	8.0E+03	na	9.6E+06
DDD [C]	0	--	--	na	3.1E-03	--	--	na	1.5E+01	--	--	na	3.1E-04	--	--	na	1.5E+00	--	--	na	1.5E+00
DDE [C]	0	--	--	na	2.2E-03	--	--	na	1.0E+01	--	--	na	2.2E-04	--	--	na	1.0E+00	--	--	na	1.0E+00
DDT [C]	0	1.1E+00	1.0E-03	na	2.2E-03	7.2E+02	6.1E+00	na	1.0E+01	2.8E-01	2.5E-04	na	2.2E-04	1.7E+03	1.5E+00	na	1.0E+00	7.2E+02	1.5E+00	na	1.0E+00
Demeton	0	--	1.0E-01	na	--	--	6.1E+02	na	--	--	2.5E-02	na	--	--	1.5E+02	na	--	--	1.5E+02	na	--
Diazinon	0	1.7E-01	1.7E-01	na	--	1.1E+02	1.0E+03	na	--	4.3E-02	4.3E-02	na	--	2.6E+02	2.6E+02	na	--	1.1E+02	2.6E+02	na	--
Dibenz(a,h)anthracene [C]	0	--	--	na	1.8E-01	--	--	na	8.5E+02	--	--	na	1.8E-02	--	--	na	8.5E+01	--	--	na	8.5E+01
1,2-Dichlorobenzene	0	--	--	na	1.3E+03	--	--	na	7.8E+06	--	--	na	1.3E+02	--	--	na	7.8E+05	--	--	na	7.8E+05
1,3-Dichlorobenzene	0	--	--	na	9.6E+02	--	--	na	5.8E+06	--	--	na	9.6E+01	--	--	na	5.8E+05	--	--	na	5.8E+05
1,4-Dichlorobenzene	0	--	--	na	1.9E+02	--	--	na	1.1E+06	--	--	na	1.9E+01	--	--	na	1.1E+05	--	--	na	1.1E+05
3,3-Dichlorobenzidine[C]	0	--	--	na	2.8E-01	--	--	na	1.3E+03	--	--	na	2.8E-02	--	--	na	1.3E+02	--	--	na	1.3E+02
Dichlorobromomethane [C]	0	--	--	na	1.7E+02	--	--	na	8.0E+05	--	--	na	1.7E+01	--	--	na	8.0E+04	--	--	na	8.0E+04
1,2-Dichloroethane [C]	0	--	--	na	3.7E+02	--	--	na	1.7E+06	--	--	na	3.7E+01	--	--	na	1.7E+05	--	--	na	1.7E+05
1,1-Dichloroethylene	0	--	--	na	7.1E+03	--	--	na	4.3E+07	--	--	na	7.1E+02	--	--	na	4.3E+06	--	--	na	4.3E+06
1,2-trans-dichloroethylene	0	--	--	na	1.0E+04	--	--	na	6.0E+07	--	--	na	1.0E+03	--	--	na	6.0E+06	--	--	na	6.0E+06
2,4-Dichlorophenol	0	--	--	na	2.9E+02	--	--	na	1.7E+06	--	--	na	2.9E+01	--	--	na	1.7E+05	--	--	na	1.7E+05
2,4-Dichlorophenoxy acetic acid (2,4-D)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
1,2-Dichloropropane[C]	0	--	--	na	1.5E+02	--	--	na	7.1E+05	--	--	na	1.5E+01	--	--	na	7.1E+04	--	--	na	7.1E+04
1,3-Dichloropropene [C]	0	--	--	na	2.1E+02	--	--	na	9.9E+05	--	--	na	2.1E+01	--	--	na	9.9E+04	--	--	na	9.9E+04
Dieldrin [C]	0	2.4E-01	5.6E-02	na	5.4E-04	1.6E+02	3.4E+02	na	2.5E+00	6.0E-02	1.4E-02	na	5.4E-05	3.7E+02	8.6E+01	na	2.5E-01	1.6E+02	8.6E+01	na	2.5E-01
Diethyl Phthalate	0	--	--	na	4.4E+04	--	--	na	2.6E+08	--	--	na	4.4E+03	--	--	na	2.6E+07	--	--	na	2.6E+07
2,4-Dimethylphenol	0	--	--	na	8.5E+02	--	--	na	5.1E+06	--	--	na	8.5E+01	--	--	na	5.1E+05	--	--	na	5.1E+05
Dimethyl Phthalate	0	--	--	na	1.1E+06	--	--	na	6.6E+09	--	--	na	1.1E+05	--	--	na	6.6E+08	--	--	na	6.6E+08
Di-n-Butyl Phthalate	0	--	--	na	4.5E+03	--	--	na	2.7E+07	--	--	na	4.5E+02	--	--	na	2.7E+06	--	--	na	2.7E+06
2,4 Dinitrophenol	0	--	--	na	5.3E+03	--	--	na	3.2E+07	--	--	na	5.3E+02	--	--	na	3.2E+06	--	--	na	3.2E+06
2-Methyl-4,6-Dinitrophenol	0	--	--	na	2.8E+02	--	--	na	1.7E+06	--	--	na	2.8E+01	--	--	na	1.7E+05	--	--	na	1.7E+05
2,4-Dinitrotoluene [C]	0	--	--	na	3.4E+01	--	--	na	1.6E+05	--	--	na	3.4E+00	--	--	na	1.6E+04	--	--	na	1.6E+04
Dioxin 2,3,7,8-tetrachlorodibenzo-p-dioxin	0	--	--	na	5.1E-08	--	--	na	3.1E-04	--	--	na	5.1E-09	--	--	na	3.1E-05	--	--	na	3.1E-05
1,2-Diphenylhydrazine[C]	0	--	--	na	2.0E+00	--	--	na	9.4E+03	--	--	na	2.0E-01	--	--	na	9.4E+02	--	--	na	9.4E+02
Alpha-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	1.4E+02	3.4E+02	na	5.3E+05	5.5E-02	1.4E-02	na	8.9E+00	3.4E+02	8.6E+01	na	5.3E+04	1.4E+02	8.6E+01	na	5.3E+04
Beta-Endosulfan	0	2.2E-01	5.6E-02	na	8.9E+01	1.4E+02	3.4E+02	na	5.3E+05	5.5E-02	1.4E-02	na	8.9E+00	3.4E+02	8.6E+01	na	5.3E+04	1.4E+02	8.6E+01	na	5.3E+04
Alpha + Beta Endosulfan	0	2.2E-01	5.6E-02	--	--	1.4E+02	3.4E+02	--	--	5.5E-02	1.4E-02	--	--	3.4E+02	8.6E+01	--	--	1.4E+02	8.6E+01	--	--
Endosulfan Sulfate	0	--	--	na	8.9E+01	--	--	na	5.3E+05	--	--	na	8.9E+00	--	--	na	5.3E+04	--	--	na	5.3E+04
Endrin	0	8.6E-02	3.6E-02	na	6.0E-02	5.6E+01	2.2E+02	na	3.6E+02	2.2E-02	9.0E-03	na	6.0E-03	1.3E+02	5.5E+01	na	3.6E+01	5.6E+01	5.5E+01	na	3.6E+01
Endrin Aldehyde	0	--	--	na	3.0E-01	--	--	na	1.8E+03	--	--	na	3.0E-02	--	--	na	1.8E+02	--	--	na	1.8E+02

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Ethylbenzene	0	--	--	na	2.1E+03	--	--	na	1.3E+07	--	--	na	2.1E+02	--	--	na	1.3E+06	--	--	na	1.3E+06
Fluoranthene	0	--	--	na	1.4E+02	--	--	na	8.4E+05	--	--	na	1.4E+01	--	--	na	8.4E+04	--	--	na	8.4E+04
Fluorene	0	--	--	na	5.3E+03	--	--	na	3.2E+07	--	--	na	5.3E+02	--	--	na	3.2E+06	--	--	na	3.2E+06
Foaming Agents	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Guthion	0	--	1.0E-02	na	--	--	6.1E+01	na	--	--	2.5E-03	na	--	--	1.5E+01	na	--	--	1.5E+01	na	--
Heptachlor [C]	0	5.2E-01	3.8E-03	na	7.9E-04	3.4E+02	2.3E+01	na	3.7E+00	1.3E-01	9.5E-04	na	7.9E-05	8.0E+02	5.8E+00	na	3.7E-01	3.4E+02	5.8E+00	na	3.7E-01
Heptachlor Epoxide[C]	0	5.2E-01	3.8E-03	na	3.9E-04	3.4E+02	2.3E+01	na	1.8E+00	1.3E-01	9.5E-04	na	3.9E-05	8.0E+02	5.8E+00	na	1.8E-01	3.4E+02	5.8E+00	na	1.8E-01
Hexachlorobenzene[C]	0	--	--	na	2.9E-03	--	--	na	1.4E+01	--	--	na	2.9E-04	--	--	na	1.4E+00	--	--	na	1.4E+00
Hexachlorobutadiene[C]	0	--	--	na	1.8E+02	--	--	na	8.5E+05	--	--	na	1.8E+01	--	--	na	8.5E+04	--	--	na	8.5E+04
Hexachlorocyclohexane Alpha-BHC[C]	0	--	--	na	4.9E-02	--	--	na	2.3E+02	--	--	na	4.9E-03	--	--	na	2.3E+01	--	--	na	2.3E+01
Hexachlorocyclohexane Beta-BHC[C]	0	--	--	na	1.7E-01	--	--	na	8.0E+02	--	--	na	1.7E-02	--	--	na	8.0E+01	--	--	na	8.0E+01
Hexachlorocyclohexane Gamma-BHC[C] (Lindane)	0	9.5E-01	na	na	1.8E+00	6.2E+02	--	na	8.5E+03	2.4E-01	--	na	1.8E-01	1.5E+03	--	na	8.5E+02	6.2E+02	--	na	8.5E+02
Hexachlorocyclopentadiene	0	--	--	na	1.1E+03	--	--	na	6.6E+06	--	--	na	1.1E+02	--	--	na	6.6E+05	--	--	na	6.6E+05
Hexachloroethane[C]	0	--	--	na	3.3E+01	--	--	na	1.6E+05	--	--	na	3.3E+00	--	--	na	1.6E+04	--	--	na	1.6E+04
Hydrogen Sulfide	0	--	2.0E+00	na	--	--	1.2E+04	na	--	--	5.0E-01	na	--	--	3.1E+03	na	--	--	3.1E+03	na	--
Indeno (1,2,3-cd) pyrene [C]	0	--	--	na	1.8E-01	--	--	na	8.5E+02	--	--	na	1.8E-02	--	--	na	8.5E+01	--	--	na	8.5E+01
Iron	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Isophorone[C]	0	--	--	na	9.6E+03	--	--	na	4.5E+07	--	--	na	9.6E+02	--	--	na	4.5E+06	--	--	na	4.5E+06
Kepone	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--
Lead	0	9.3E+01	1.1E+01	na	--	6.0E+04	6.5E+04	na	--	2.3E+01	2.6E+00	na	--	1.4E+05	1.6E+04	na	--	6.0E+04	1.6E+04	na	--
Malathion	0	--	1.0E-01	na	--	--	6.1E+02	na	--	--	2.5E-02	na	--	--	1.5E+02	na	--	--	1.5E+02	na	--
Manganese	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Mercury	0	1.4E+00	7.7E-01	--	--	9.1E+02	4.7E+03	--	--	3.5E-01	1.9E-01	--	--	2.2E+03	1.2E+03	--	--	9.1E+02	1.2E+03	--	--
Methyl Bromide	0	--	--	na	1.5E+03	--	--	na	9.0E+06	--	--	na	1.5E+02	--	--	na	9.0E+05	--	--	na	9.0E+05
Methylene Chloride [C]	0	--	--	na	5.9E+03	--	--	na	2.8E+07	--	--	na	5.9E+02	--	--	na	2.8E+06	--	--	na	2.8E+06
Methoxychlor	0	--	3.0E-02	na	--	--	1.8E+02	na	--	--	7.5E-03	na	--	--	4.6E+01	na	--	--	4.6E+01	na	--
Mirex	0	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--	--	0.0E+00	na	--
Nickel	0	1.5E+02	1.7E+01	na	4.6E+03	1.0E+05	1.1E+05	na	2.8E+07	3.9E+01	4.3E+00	na	4.6E+02	2.4E+05	2.6E+04	na	2.8E+06	1.0E+05	2.6E+04	na	2.8E+06
Nitrate (as N)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Nitrobenzene	0	--	--	na	6.9E+02	--	--	na	4.1E+06	--	--	na	6.9E+01	--	--	na	4.1E+05	--	--	na	4.1E+05
N-Nitrosodimethylamine[C]	0	--	--	na	3.0E+01	--	--	na	1.4E+05	--	--	na	3.0E+00	--	--	na	1.4E+04	--	--	na	1.4E+04
N-Nitrosodiphenylamine[C]	0	--	--	na	6.0E+01	--	--	na	2.8E+05	--	--	na	6.0E+00	--	--	na	2.8E+04	--	--	na	2.8E+04
N-Nitrosodi-n-propylamine[C]	0	--	--	na	5.1E+00	--	--	na	2.4E+04	--	--	na	5.1E-01	--	--	na	2.4E+03	--	--	na	2.4E+03
Nonylphenol	0	2.8E+01	6.6E+00	--	--	1.8E+04	4.0E+04	na	--	7.0E+00	1.7E+00	--	--	4.3E+04	1.0E+04	--	--	1.8E+04	1.0E+04	na	--
Parathion	0	6.5E-02	1.3E-02	na	--	4.2E+01	8.0E+01	na	--	1.6E-02	3.3E-03	na	--	1.0E+02	2.0E+01	na	--	4.2E+01	2.0E+01	na	--
PCB Total[C]	0	--	1.4E-02	na	6.4E-04	--	8.6E+01	na	3.0E+00	--	3.5E-03	na	6.4E-05	--	2.1E+01	na	3.0E-01	--	2.1E+01	na	3.0E-01
Pentachlorophenol [C]	0	1.3E+01	1.0E+01	na	3.0E+01	8.5E+03	6.1E+04	na	1.4E+05	3.3E+00	2.5E+00	na	3.0E+00	2.0E+04	1.5E+04	na	1.4E+04	8.5E+03	1.5E+04	na	1.4E+04
Phenol	0	--	--	na	8.6E+05	--	--	na	5.2E+09	--	--	na	8.6E+04	--	--	na	5.2E+08	--	--	na	5.2E+08
Pyrene	0	--	--	na	4.0E+03	--	--	na	2.4E+07	--	--	na	4.0E+02	--	--	na	2.4E+06	--	--	na	2.4E+06
Radionuclides	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Gross Alpha Activity (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Beta and Photon Activity (mrem/yr)	0	--	--	na	4.0E+00	--	--	na	2.4E+04	--	--	na	4.0E-01	--	--	na	2.4E+03	--	--	na	2.4E+03
Radium 226 + 228 (pCi/L)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--
Uranium (ug/l)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--

Parameter	Background	Water Quality Criteria				Wasteload Allocations				Antidegradation Baseline				Antidegradation Allocations				Most Limiting Allocations			
(ug/l unless noted)	Conc.	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH	Acute	Chronic	HH (PWS)	HH
Selenium, Total Recoverable	0	2.0E+01	5.0E+00	na	4.2E+03	1.3E+04	3.1E+04	na	2.5E+07	5.0E+00	1.3E+00	na	4.2E+02	3.1E+04	7.7E+03	na	2.5E+06	**1.3E+04**	**7.7E+03**	**na**	**2.5E+06**
Silver	0	2.5E+00	--	na	--	1.6E+03	--	na	--	6.2E-01	--	na	--	3.8E+03	--	na	--	**1.6E+03**	**--**	**na**	**--**
Sulfate	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
1,1,2,2-Tetrachloroethane[C]	0	--	--	na	4.0E+01	--	--	na	1.9E+05	--	--	na	4.0E+00	--	--	na	1.9E+04	**--**	**--**	**na**	**1.9E+04**
Tetrachloroethylene[C]	0	--	--	na	3.3E+01	--	--	na	1.6E+05	--	--	na	3.3E+00	--	--	na	1.6E+04	**--**	**--**	**na**	**1.6E+04**
Thallium	0	--	--	na	4.7E-01	--	--	na	2.8E+03	--	--	na	4.7E-02	--	--	na	2.8E+02	**--**	**--**	**na**	**2.8E+02**
Toluene	0	--	--	na	6.0E+03	--	--	na	3.6E+07	--	--	na	6.0E+02	--	--	na	3.6E+06	**--**	**--**	**na**	**3.6E+06**
Total dissolved solids	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Toxaphene [C]	0	7.3E-01	2.0E-04	na	2.8E-03	4.7E+02	1.2E+00	na	1.3E+01	1.8E-01	5.0E-05	na	2.8E-04	1.1E+03	3.1E-01	na	1.3E+00	**4.7E+02**	**3.1E-01**	**na**	**1.3E+00**
Tributyltin	0	4.6E-01	7.2E-02	na	--	3.0E+02	4.4E+02	na	--	1.2E-01	1.8E-02	na	--	7.1E+02	1.1E+02	na	--	**3.0E+02**	**1.1E+02**	**na**	**--**
1,2,4-Trichlorobenzene	0	--	--	na	7.0E+01	--	--	na	4.2E+05	--	--	na	7.0E+00	--	--	na	4.2E+04	**--**	**--**	**na**	**4.2E+04**
1,1,2-Trichloroethane[C]	0	--	--	na	1.6E+02	--	--	na	7.5E+05	--	--	na	1.6E+01	--	--	na	7.5E+04	**--**	**--**	**na**	**7.5E+04**
Trichloroethylene [C]	0	--	--	na	3.0E+02	--	--	na	1.4E+06	--	--	na	3.0E+01	--	--	na	1.4E+05	**--**	**--**	**na**	**1.4E+05**
2,4,6-Trichlorophenol [C]	0	--	--	na	2.4E+01	--	--	na	1.1E+05	--	--	na	2.4E+00	--	--	na	1.1E+04	**--**	**--**	**na**	**1.1E+04**
2-(2,4,5-Trichlorophenoxy) propionic acid (Silvex)	0	--	--	na	--	--	--	na	--	--	--	na	--	--	--	na	--	**--**	**--**	**na**	**--**
Vinyl Chloride[C]	0	--	--	na	2.4E+01	--	--	na	1.1E+05	--	--	na	2.4E+00	--	--	na	1.1E+04	**--**	**--**	**na**	**1.1E+04**
Zinc	0	9.9E+01	1.0E+02	na	2.6E+04	6.5E+04	6.1E+05	na	1.6E+08	2.5E+01	2.5E+01	na	2.6E+03	1.5E+05	1.5E+05	na	1.6E+07	**6.5E+04**	**1.5E+05**	**na**	**1.6E+07**

Notes:

1. All concentrations expressed as micrograms/liter (ug/l), unless noted otherwise
2. Discharge flow is highest monthly average or Form 2C maximum for Industries and design flow for Municipals
3. Metals measured as Dissolved, unless specified otherwise
4. "C" indicates a carcinogenic parameter
5. Regular WLAs are mass balances (minus background concentration) using the % of stream flow entered above under Mixing Information.
   Antidegradation WLAs are based upon a complete mix.
6. Antideg. Baseline = (0.25(WQC - background conc.) + background conc.) for acute and chronic
   = (0.1(WQC - background conc.) + background conc.) for human health
7. WLAs established at the following stream flows: 1Q10 for Acute, 30Q10 for Chronic Ammonia, 7Q10 for Other Chronic, 30Q5 for Non-carcinogens and Harmonic Mean for Carcinogens. To apply mixing ratios from a model set the stream flow equal to (mixing ratio - 1), effluent flow equal to 1 and 100% mix.

Metal	Target Value (SSTV)
Antimony	3.8E+05
Arsenic	8.8E+04
Barium	na
Cadmium	8.2E+02
Chromium III	5.8E+04
Chromium VI	4.2E+03
Copper	2.9E+03
Iron	na
Lead	9.7E+03
Manganese	na
Mercury	3.6E+02
Nickel	1.6E+04
Selenium	4.6E+03
Silver	6.4E+02
Zinc	2.6E+04

Note: do not use QL's lower than the minimum QL's provided in agency guidance

0.015 MGD DISCHARGE FLOW - STREAM MIX PER "Mix.exe"

Discharge Flow Used for WQS-WLA Calculations (MGI 0.015

	Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	9.740	90.300	9.755	90.315
7Q10	92.000	N/A	92.015	N/A
30Q10	91.100	85.700	91.115	85.715
30Q5	90.100	N/A	90.115	N/A
Harm. Mean	70.700	N/A	70.715	N/A
Annual Avg.	0.000	N/A	0.015	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	18.006	13.001
30Q10 90th% Temp. Mix (deg C)	18.001	13.001
1Q10 90th% pH Mix (SU)	8.100	8.100
30Q10 90th% pH Mix (SU)	8.100	8.100
1Q10 10th% pH Mix (SU)	7.400	N/A
7Q10 10th% pH Mix (SU)	7.400	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3)	82.2	82.2
7Q10 Hardness (mg/L as CaCO3)	82.2	82.2

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	8.100
(7.204 - pH)	-0.896
(pH - 7.204)	0.896
Trout Present Criterion (mg N/l	4.642
Trout Absent Criterion (mg N/L	6.951
Trout Present?	n
Effective Criterion (mg N/L)	6.951

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	18.001
90th Percentile pH (SU)	8.100
MIN	2.277
MAX	18.001
(7.688 - pH)	-0.412
(pH - 7.688)	0.412
Early LS Present Criterion (mg N	1.676
Early LS Absent Criterion (mg N/	1.676
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.676

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	8.100
(7.204 - pH)	-0.896
(pH - 7.204)	0.896
Trout Present Criterion (mg N/l	4.641
Trout Absent Criterion (mg N/L	6.949
Trout Present?	n
Effective Criterion (mg N/L)	6.949

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	13.001
90th Percentile pH (SU)	8.100
MIN	2.850
MAX	13.001
(7.688 - pH)	-0.412
(pH - 7.688)	0.412
Early LS Present Criterion (mg N	2.097
Early LS Absent Criterion (mg N/	2.313
Early Life Stages Present?	y
Effective Criterion (mg N/L)	2.097

0.015 MGD DISCHARGE FLOW - COMPLETE STREAM MIX

Discharge Flow Used for WQS-WLA Calculations (MGI 0.015

	100% Stream Flows Allocated to Mix (MGD)		Total Mix Flows Stream + Discharge (MGD)	
	Dry Season	Wet Season	Dry Season	Wet Season
1Q10	92.500	90.300	92.515	90.315
7Q10	92.000	N/A	92.015	N/A
30Q10	91.100	85.700	91.115	85.715
30Q5	90.100	N/A	90.115	N/A
Harm. Mean	70.700	N/A	70.715	N/A
Annual Avg.	0.000	N/A	0.015	N/A

Stream/Discharge Mix Values

	Dry Season	Wet Season
1Q10 90th% Temp. Mix (deg C)	18.001	13.001
30Q10 90th% Temp. Mix (deg C)	18.001	13.001
1Q10 90th% pH Mix (SU)	8.100	8.100
30Q10 90th% pH Mix (SU)	8.100	8.100
1Q10 10th% pH Mix (SU)	7.400	N/A
7Q10 10th% pH Mix (SU)	7.400	N/A

	Calculated	Formula Inputs
1Q10 Hardness (mg/L as CaCO3) =	82.200	82.200
7Q10 Hardness (mg/L as CaCO3) =	82.200	82.200

Ammonia - Dry Season - Acute

90th Percentile pH (SU)	8.100
(7.204 - pH)	-0.896
(pH - 7.204)	0.896
Trout Present Criterion (mg N/l	4.641
Trout Absent Criterion (mg N/L	6.949
Trout Present?	n
Effective Criterion (mg N/L)	6.949

Ammonia - Dry Season - Chronic

90th Percentile Temp. (deg C)	18.001
90th Percentile pH (SU)	8.100
MIN	2.277
MAX	18.001
(7.688 - pH)	-0.412
(pH - 7.688)	0.412
Early LS Present Criterion (mg N	1.676
Early LS Absent Criterion (mg N/	1.676
Early Life Stages Present?	y
Effective Criterion (mg N/L)	1.676

Ammonia - Wet Season - Acute

90th Percentile pH (SU)	8.100
(7.204 - pH)	-0.896
(pH - 7.204)	0.896
Trout Present Criterion (mg N/l	4.641
Trout Absent Criterion (mg N/L	6.949
Trout Present?	n
Effective Criterion (mg N/L)	6.949

Ammonia - Wet Season - Chronic

90th Percentile Temp. (deg C)	13.001
90th Percentile pH (SU)	8.100
MIN	2.850
MAX	13.001
(7.688 - pH)	-0.412
(pH - 7.688)	0.412
Early LS Present Criterion (mg N	2.097
Early LS Absent Criterion (mg N/	2.313
Early Life Stages Present?	y
Effective Criterion (mg N/L)	2.097

3/12/2014 10:44:20 AM

Facility = Morris Hill STP
Chemical = ammonia (mg/L)
Chronic averaging period = 30
WLAa = 4500
WLAc =
Q.L. = 0.2
# samples/mo. = 1
# samples/wk. = 1

Summary of Statistics:

observations = 1
Expected Value = 9
Variance = 29.16
C.V. = 0.6
97th percentile daily values = 21.9007
97th percentile 4 day average = 14.9741
97th percentile 30 day average= 10.8544
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

No Limit is required for this material

The data are:

9

3/12/2014 10:45:12 AM

Facility = Morris Hill STP
Chemical = TRC (mg/L)
Chronic averaging period = 4
WLAa = 4
WLAc =
Q.L. = 0.1
# samples/mo. = 30
# samples/wk. = 8

Summary of Statistics:

observations = 1
Expected Value = 1000
Variance = 360000
C.V. = 0.6
97th percentile daily values = 2433.41
97th percentile 4 day average = 1663.79
97th percentile 30 day average= 1206.05
< Q.L. = 0
Model used = BPJ Assumptions, type 2 data

A limit is needed based on Acute Toxicity
Maximum Daily Limit = 4
Average Weekly limit = 2.38602034360889
Average Monthly LImit = 1.98248465547072

The data are:

1000

Attachment G

Regional Water Quality Model Output (Version 4.0)

REGIONAL MODELING SYSTEM VERSION 4.0

Model Input File for the Discharge to JACKSON RIVER.

File Information

File Name:	C:\Users\pmp94864\Documents\Working files\BECKY\PERMITS\VPDES\M
Date Modified:	March 14, 2014

Water Quality Standards Information

Stream Name:	JACKSON RIVER
River Basin:	James River Basin
Section:	12
Class:	VI - Natural Trout Waters
Special Standards:	none

Background Flow Information

Gauge Used:	Jackson River
Gauge Drainage Area:	0.00001 Sq.Mi.
Gauge 7Q10 Flow:	92 MGD
Headwater Drainage Area:	0 Sq.Mi.
Headwater 7Q10 Flow:	92 MGD (Net; includes Withdrawals/Discharges)
Withdrawal/Discharges:	0 MGD
Incremental Flow in Segments:	9200000 MGD/Sq.Mi.

Background Water Quality

Background Temperature:	18 Degrees C
Background cBOD5:	2 mg/l
Background TKN:	0 mg/l
Background D.O.:	7.973469 mg/l

Model Segmentation

Number of Segments:	1
Model Start Elevation:	1800 ft above MSL
Model End Elevation:	1778 ft above MSL

REGIONAL MODELING SYSTEM VERSION 4.0
Model Input File for the Discharge to JACKSON RIVER.

Segment Information for Segment 1

Definition Information

Segment Definition:	A discharge enters.
Discharge Name:	MORRIS HILL STP
VPDES Permit No.:	VA0032115

Discharger Flow Information

Flow:	0.015 MGD
cBOD5:	30 mg/l
TKN:	20 mg/l
D.O.:	6.5 mg/l
Temperature:	22 Degrees C

Geographic Information

Segment Length:	0.5 miles
Upstream Drainage Area:	0 Sq.Mi.
Downstream Drainage Area:	0 Sq.Mi.
Upstream Elevation:	1800 Ft.
Downstream Elevation:	1778 Ft.

Hydraulic Information

Segment Width:	175 Ft.
Segment Depth:	0.782 Ft.
Segment Velocity:	1.04 Ft./Sec.
Segment Flow:	92.015 MGD
Incremental Flow:	0 MGD (Applied at end of segment.)

Channel Information

Cross Section:	Rectangular
Character:	Mostly Straight
Pool and Riffle:	No
Bottom Type:	Small Rock
Sludge:	None
Plants:	None
Algae:	None

"Model Run For C:\Users\pmp94864\Documents\Working files\BECKY\PERMITS\VPDES\Morris Hill WWTP\Reissuance 2014\Data\Morris Hill Model 2.mod On 3/18/2014 7:53:54 AM"

"Model is for JACKSON RIVER."
"Model starts at the MORRIS HILL STP discharge."

"Background Data"

"7Q10"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
92,	2,	0,	7.973,	18

"Discharge/Tributary Input Data for Segment 1"

"Flow"	"cBOD5"	"TKN"	"DO"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
.015,	30,	20,	,6.5,	22

"Hydraulic Information for Segment 1"

"Length"	"Width"	"Depth"	"Velocity"
"(mi)"	"(ft)"	"(ft)"	"(ft/sec)"
.5,	175,	.782,	1.04

"Initial Mix Values for Segment 1"

"Flow"	"DO"	"cBOD"	"nBOD"	"DOSat"	"Temp"
"(mgd)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"(mg/l)"	"deg C"
92.015,	7.973,	5.011,	.012,	8.863,	18.00065

"Rate Constants for Segment 1. - (All units Per Day)"

"k1"	"k1@T"	"k2"	"k2@T"	"kn"	"kn@T"	"BD"	"BD@T"
1,	.912,	20,	19.074,	.45,	.386,	0,	0

"Output for Segment 1"
"Segment starts at MORRIS HILL STP"

"Total" "Dist."	"Segm." "Dist."	"DO"	"cBOD"	"nBOD"
"(mi)"	"(mi)"	"(mg/l)"	"(mg/l)"	"(mg/l)"
0,	0,	7.973,	5.011,	.012
.1,	.1,	7.977,	5,	.012
.2,	.2,	7.977,	5,	.012
.3,	.3,	7.977,	5,	.012
.4,	.4,	7.977,	5,	.012
.5,	.5,	7.977,	5,	.012

"END OF FILE"

Attachment H

Justification for Reduced Monitoring Frequency Memorandum

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY
Blue Ridge Regional Office

3019 Peters Creek Road Roanoke, VA 24019

SUBJECT: Justification for Reduced Monitoring Frequency
Reissuance of VPDES Permit No. VA0032115
Morris Hill STP

TO: Permit File

FROM: Becky L. France, Water Permit Writer BLF

DATE: March 10, 2014

Compliance History

The VPDES Permit Manual recommends effluent monitoring frequencies. In the previous permit term, the treatment facility qualified for reduced monitoring frequencies. Guidance Memo 98-2005 allows for reduced monitoring at facilities with excellent compliance histories. During the 2009 to 2014 permit term the facility permit contained reduced monitoring frequencies for DO, TSS, and BOD_5. For this reissuance, the eligibility for continued reduced monitoring has been evaluated.

To qualify for consideration of reduced monitoring, the facility should not have been issued any Letter of Noncompliance (LON), Notice of Violation (NOV), Warning Letter or be under any Consent Orders, Consent Decrees, Executive Compliance Agreements, or related enforcement documents during the past three years. The facility has not received any warning letters or enforcement actions, so it qualifies for reduced monitoring.

Monitoring Data Evaluation

Discharge Monitoring Report (DMR) data for pH and dissolved oxygen (DO) from March 2011 through April 2014 were reviewed and tabulated in the attached tables. Reduced frequency monitoring for total suspended solids (TSS) and biochemical oxygen demand (BOD_5) from January 2088 through April 2014 were reviewed and tabulated in the attached tables.

Dissolved oxygen (DO), pH, total suspended solids (TSS), and biochemical oxygen demand (BOD_5) have been considered for reduced monitoring. Total residual chlorine limits are not considered eligible for reduced monitoring to ensure protection of aquatic life and human health. The actual performance to permit limit ratios are summarized in the table that follows. Facilities with baseline monitoring that have an actual performance to permit limit ratio of greater than 75 percent are not eligible for reduced monitoring.

Table 1 **Performance to Permit Limit Ratios (DMR Data)**

Parameter	Actual Performance/ Permit Limit Monthly Average*	Actual Performance/ Permit Limit (Maximum)*	Reduced Monitoring
TSS	6.95%, 0.01%	4.63%, 0.01%	1 /6 Months
BOD_5	9.76%, 0.001%	6.51%, 0.001%	1 /6 Months

*The ratio based upon concentration is listed first, and the ratio based upon loading is listed second.

DO: None of the reported values was within 0.5 mg/L of the limit. Also, the average dissolved oxygen does not fall within 1.0 mg/L of the permit limit. For these reasons, the monitoring frequency for dissolved oxygen is 1/discharge-week and this frequency has been continued from the previous permit.

pH: The permittee does not add chemicals during the treatment process. So, pH may be considered for reduced monitoring. During the permit term, the pH ranged from 6.4 S.U. to 8.3 S.U. There was one datum within 0.5 S.U. (6.4 S.U.) of the permit limit. So, based on the monitoring data, pH does not qualify for reduced monitoring.

TSS and BOD_5: The DMR data are consistently well below the permit limits. According to Guidance Memo 98-2005, facilities with baseline monitoring that have an actual performance to permit limit ratio of less than 25 percent are eligible for a reduced monitoring frequency of 1/6 months. The reduced monitoring frequency of 1/ 6 months for TSS and BOD_5 has been continued from the previous permit.

The permit will contain a special condition that will revert the TSS and BOD_5 monitoring frequencies back to 1/month and the DO to 1/discharge-day if the permittee should be issued a Warning Letter or be the subject of an active enforcement action.

Table 2 **DMR Data for Morris Hill STP**

Month	BOD_5			
	average g/d	max g/d	average mg/L	max mg/L
10-Jan-08	0.0212	0.0212	4	4
10-Apr-08	0.0477	0.0477	7	7
10-Jul-08	0.0341	0.0341	5	5
10-Oct-08	0.1363	0.1363	18	18
10-Apr-09	<QL	<QL	<QL	<QL
10-Jul-09	<QL	<QL	<QL	<QL
10-Apr-10	<QL	<QL	<QL	<QL
10-Oct-10	<QL	<QL	<QL	<QL
10-Apr-11	0.0341	0.0341	5	5
10-Oct-11	<QL	<QL	<QL	<QL
10-Apr-12	0.0136	0.0136	2	2
10-Oct-12	<QL	<QL	<QL	<QL
10-Apr-13	<QL	<QL	<QL	<QL
10-Oct-13	0.0018	0.0018	<QL	<QL
mean	0.021	0.021	2.929	2.929
maximum	0.1363	0.1363	18	18
minimum	<QL	<QL	<QL	<QL
permit limit	1700	2500.0	*30*	*45*
performance / permit limit) 100	0.001	0.001	9.76	6.51

Table 3 **DMR Data for Morris Hill STP**

Month	TSS			
	average g/d	max g/d	average mg/L	max mg/L
10-Apr-08	0.0106	0.0106	2	2
10-Oct-08	0.0136	0.0136	2	2
10-Apr-09	0.0341	0.0341	5	5
10-Oct-09	0.0136	0.0136	2	2
10-Apr-10	<QL	<QL	<QL	<QL
10-Oct-10	2	2	0.0136	0.0136
10-Apr-11	0.0068	0.0068	1	1
10-Oct-11	0.0273	0.0273	4	4
10-Apr-12	0.0068	0.0068	1	1
10-Oct-12	0.0204	0.0204	3	3
10-Apr-13	<QL	<QL	<QL	<QL
10-Oct-13	0.0018	0.0018	5	5
mean	0.17792	0.17792	2.08	2.08
maximum	2	2	5	5
minimum	<QL	<QL	<QL	<QL
permit limit	1700	2500	*30*	*45*
(mean performance / permit limit) 100	0.01	0.01	6.95	4.63

Table 4

pH Data

Date DMR Due	pH, min S.U.	H ion conc	pH, max S.U.	H ion conc
10-Apr-11	7.5	3.162E-08	7.6	2.512E-08
10-May-11	7.7	1.995E-08	7.8	1.585E-08
10-Jun-11	7.6	2.512E-08	7.9	1.259E-08
10-Jul-11	7.9	1.259E-08	8.1	7.943E-09
10-Aug-11	7.2	6.310E-08	7.9	1.259E-08
10-Sep-11	7.4	3.981E-08	8.3	5.012E-09
10-Oct-11	6.4	3.981E-07	7.6	2.512E-08
10-Nov-11	6.9	1.259E-07	6.9	1.259E-07
10-Dec-11	7.4	3.981E-08	7.4	3.981E-08
10-Jan-12	7.3	5.012E-08	7.3	5.012E-08
10-Mar-12	7.6	2.512E-08	7.6	2.512E-08
10-Apr-12	7.3	5.012E-08	7.3	5.012E-08
10-May-12	7.7	1.995E-08	7.7	1.995E-08
10-Jun-12	7.6	2.512E-08	7.9	1.259E-08
10-Jul-12	7.6	2.512E-08	7.8	1.585E-08
10-Aug-12	7.4	3.981E-08	7.5	3.162E-08
10-Sep-12	7.4	3.981E-08	7.4	3.981E-08
10-Oct-12	7.7	1.995E-08	7.9	1.259E-08
10-Nov-12	7.4	3.981E-08	7.4	3.981E-08
10-Feb-13	7.5	3.162E-08	7.5	3.162E-08
10-Mar-13	7.2	6.310E-08	7.2	6.310E-08
10-Apr-13	7.6	2.512E-08	7.8	1.585E-08
10-May-13	7.7	1.995E-08	7.7	1.995E-08
10-Jun-13	7.4	3.981E-08	8	1.000E-08
10-Jul-13	7.4	3.981E-08	7.6	2.512E-08
10-Aug-13	7.8	1.585E-08	7.9	1.259E-08
10-Sep-13	7.7	1.995E-08	7.7	1.995E-08
10-Oct-13	7.4	3.981E-08	7.4	3.981E-08
10-Nov-13	7.5	3.162E-08	7.8	1.585E-08
10-Feb-14	7.8	1.585E-08	7.8	1.585E-08
10-Mar-14	7.9	1.259E-08	7.9	1.259E-08
mean	7.41	3.908E-08	7.64	2.297E-08
maximum			8.30	
minimum	6.40			
permit limit	6.0	1.000E-06	9.0	1.000E-09

Table 5

	DO (mg/L)
Date DMR Due	minimum
10-Apr-11	13
10-May-11	9
10-Jun-11	9.2
10-Jul-11	8.4
10-Aug-11	7.8
10-Sep-11	7.7
10-Oct-11	8.6
10-Nov-11	10.4
10-Dec-11	9
10-Jan-12	12
10-Mar-12	12.3
10-Apr-12	10.3
10-May-12	10
10-Jun-12	9.5
10-Jul-12	8.7
10-Aug-12	7.8
10-Sep-12	8.4
10-Oct-12	8.6
10-Nov-12	10.2
10-Feb-13	11.8
10-Mar-13	13
10-Apr-13	11.9
10-May-13	12
10-Jun-13	9.4
10-Jul-13	8.5
10-Aug-13	8
10-Sep-13	8.6
10-Oct-13	8.9
10-Nov-13	10.3
10-Feb-14	14.4
10-Mar-14	13.8
mean	**10.0**
maximum	**14.4**
minimum	**7.7**
permit limit	**6.5**

Attachment I

Public Notice

PUBLIC NOTICE – Environmental Permit

PURPOSE OF NOTICE: To seek public comment on a draft permit from the Department of Environmental Quality that will allow the release of treated wastewater into a water body in Alleghany County.
PUBLIC COMMENT PERIOD: April 27, 2014 through May 27, 2014
PERMIT NAME: Virginia Pollutant Discharge Elimination System Permit – Wastewater issued by DEQ, under the authority of the State Water Control Board
APPLICANT NAME, ADDRESS, AND PERMIT NUMBER: U.S. Army Corps of Engineers, PO Box 432, Covington, VA 24426-0432, VA0032115
FACILITY NAME AND LOCATION: Morris Hill STP, Coles Mountain Road (SR 605), south of Gathright Dam
PROJECT DESCRIPTION: Morris Hill STP has applied for a reissuance of a permit for the public wastewater treatment plant. The applicant proposes to release treated sewage wastewater at a rate of 15,000 gallons per day from the current facility into a water body. The facility proposes to release the treated sewage into the Jackson River in the Jackson River/Falling Spring Creek Watershed (VAW-IO4R). A watershed is the land area drained by a river and its incoming streams. The permit will limit the following pollutants to amounts that protect water quality: organic matter, solids, toxic pollutants, dissolved oxygen
HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING: DEQ accepts comments and requests for public hearing by e-mail, fax, or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for a public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requestor, including how and extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. A public hearing may be held, including another comment period, if a public response is significant, based on individual requests for a public hearing, and there are substantial, disputed issues relevant to the permit.
CONTACT FOR PUBLIC COMMENTS, DOCUMENT REQUESTS, AND ADDITIONAL INFORMATION: Becky L. France; ADDRESS: Virginia Department of Environmental Quality, Blue Ridge Regional Office, 3019 Peters Creek Road, Roanoke, VA 24019-2738; (540) 562-6700; E-MAIL ADDRESS: becky.france@deq.virginia.gov; FAX: (540) 562-6725. The public may review the draft permit and application at the DEQ office named above by appointment or may request copies of the documents from the contact person listed above.